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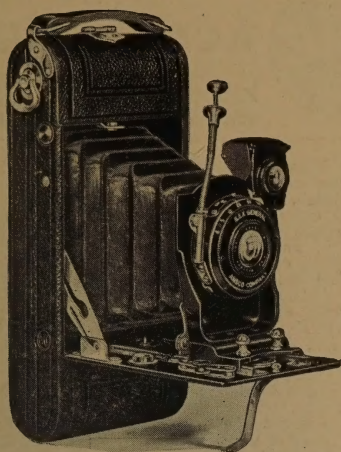
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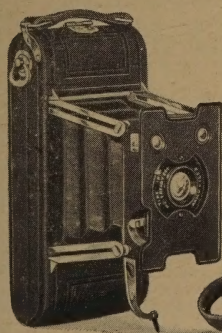
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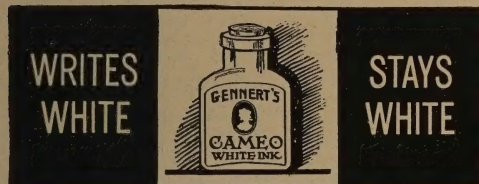
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1. Every print submitted must show a baby, under five years of age, in a playful or natural pose (see cut). The baby must be the dominant feature.
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3. Write your name and address on the back of *each* photograph and mark the outside wrapper "*Baby Picture Contest.*" Be sure to put sufficient postage on the wrapper so it will be delivered "Postpaid."
4. If you desire prints returned, enclose postage to cover them.
5. Prize-winning pictures will not be returned, as these pictures and the negatives become our property.
6. We reserve the right to reproduce the prize-winning photographs.
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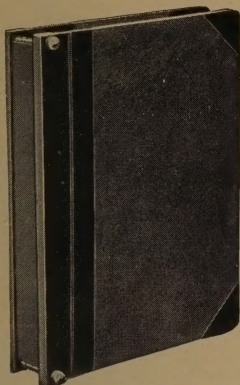
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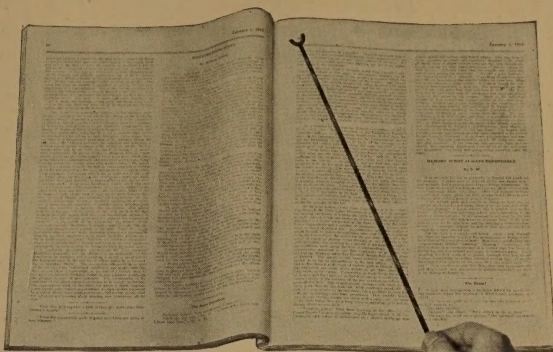
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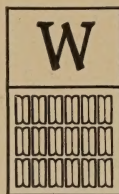
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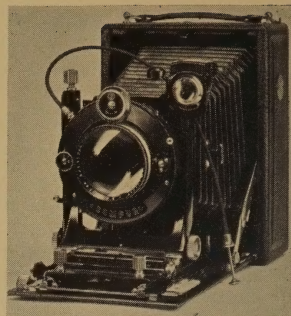
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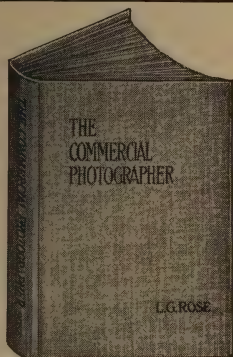
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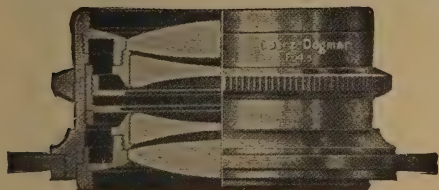
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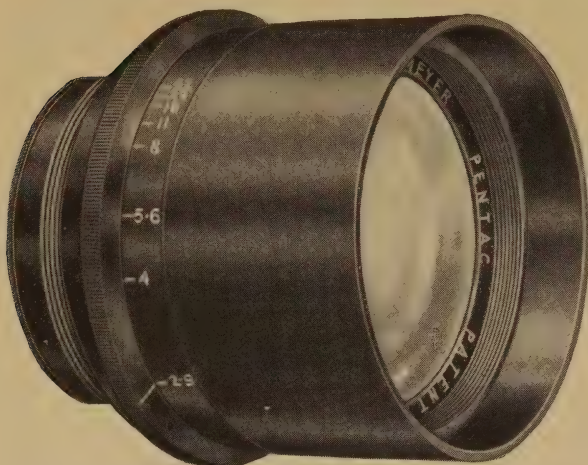
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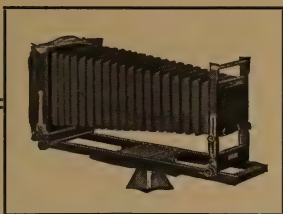
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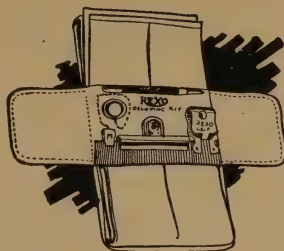
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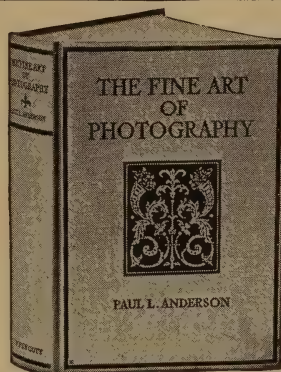
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VOL. IV

APRIL, 1924

No. 4

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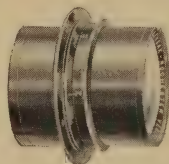
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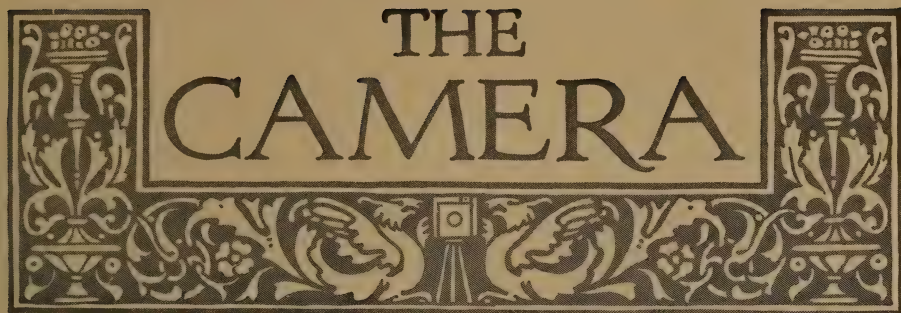
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Volume XXVIII

APRIL 1924

Number Four

SOME PICTORIAL TERMS DEFINED— WILLIAM S. DAVIS



ANY of the terms commonly used by painters and pictorial photographers in discussing art problems and in criticising pictures are "all Greek" to those who haven't had occasion or opportunity to learn their meaning! Such terms must, however, be used in speaking or writing about the more advanced phases of pictorial photography, even though their employment admittedly places the novice at a disadvantage in trying to understand articles or criticisms in which they are freely used, for no other words express so concisely the qualities referred to. For these reasons, explanations of the principal terms employed are given herewith, with the idea that they may assist those who are unfamiliar with them to a better understanding of some of the articles upon picture-making that appear at intervals in the photographic press.

Accent. One of the elements of "composition" (*q. v.*), commonly employed to draw attention to a definite spot in the picture. The usual method of producing an accent in a composition is to introduce a light or a dark spot amid an area of contrasting tone, though in color-work a similar effect may be obtained by means of *color contrast* alone.

Aerial Perspective. The appearance of space between near and distant parts of a scene, imparted by the action of the atmosphere upon the tone gradations of receding parts.

Balance. Used in referring to the proper placement within the picture-space of such objects or areas of tone as exert an important influence upon the appearance of the picture as a whole. One method that is sometimes used in determining where to place certain elements to secure a balanced effect is to

regard the picture as divided by an imaginary line through the center. The most important mass of tone in one section is then regarded as a weight to be counter-balanced by another mass, located in some portion of the section opposite. When this secondary mass is of a similar tone, but smaller in area than the principal mass, the difference in "weight" is offset by placing the smaller further from the center, just as a light weight on the long arm of a pair of "steelyards" serves to balance a much greater weight suspended from the end of the beam nearest the pivot.

Breadth. The feeling created when the minor tones and details in a subject are properly subordinated, and the essential structural elements of the composition are presented as harmoniously related masses of tone.

Chiaroscuro. An Italian word, long used with reference to the play of light and shadow in a picture. While still employed, many critics now prefer such words as "values" and "notan," as they describe more precisely certain qualities of tone-gradation. See *Notan* and *Values*.

Composition. The margins of a picture form boundary-lines enclosing a space of definite shape. The way in which individual parts of the subject-matter are distributed over this space to form a harmonious design, constitutes what is known to the picture-maker as composition.

Contre Jour. A French term for "against the light" effects, *i. e.*, the illumination of a scene produced when the sun, or other illuminant, is in front of the observer.

Focal Point. Used in an art sense, the meaning of this term is quite different than when applied to the formation of the optical image by a lens, since it is not used to denote the maximum degree of definition in the picture, but the section, or point, in a composition toward which the eye naturally turns and rests upon. In other words, the outstanding feature to which the eye is led by the trend of prominent lines, or by tonal accent.

Foreshortening. Descriptive of the appearance of an object that is placed at an angle to the observer, which causes the receding side to be seen obliquely.

Half-tones. As a pictorial term, this is employed to designate collectively those tone-gradations that are approximately intermediate between black and white.

High-lights. The brightest tones or gradations in a picture. While the high-lights *may* sometimes be pure white, they are usually a good bit removed from it in a truthful rendition of an average subject.

Key. As a term it is borrowed from the vocabulary of music. When applied to pictorial works, it means the position in the tonal scale of the gradations composing the image; considering their collective effect, rather than each gradation separately. The lightest tone is always spoken of as being the "highest" and the darkest as the "lowest" in the scale; consequently a "high-key" effect is one in which the feeling of lightness prevails, and one pitched in a "low-key" is composed in the main of dark tones.

Linear Perspective. This, as the word "linear" indicates, refers to the effect of recession and distance in a picture, as conveyed by the convergence of



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From the Lauffer Exhibit at the Detroit Camera Club

parallel lines toward a common vanishing-point and the relative scale upon which objects at different distances from the observer are represented.

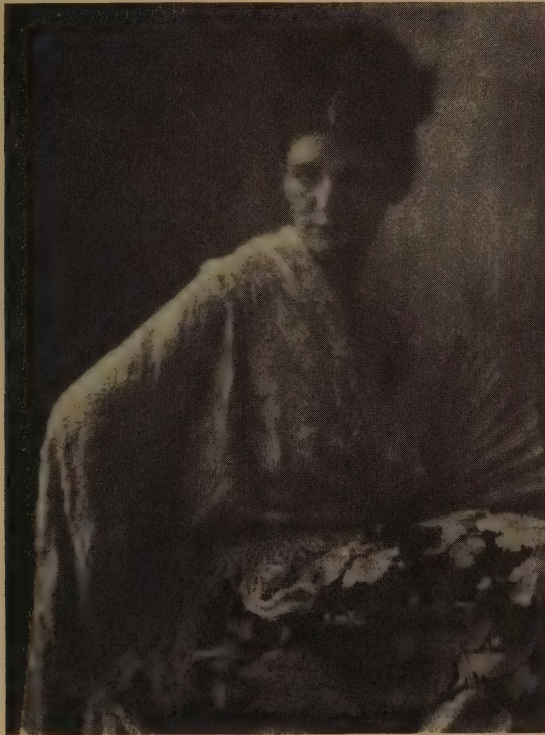
Line Effect. Setting aside the matter of color, the elements of composition are *line* and *tone*. Line effect may, of course, include individual lines which form part of the detail in certain subjects (such as the masts and rigging of a ship), but the term is primarily employed to designate the pattern formed by the varied shapes of the materials shown in a picture, *i. e.*, the outlines of well-defined areas of tone.

Lost-Edge. In many scenes one tone melts into another so softly that some of the outlines of a given mass or object fuse with adjacent parts. Hence, the expression "lost-edge."

Masses. The large areas in a picture composed of fairly uniform tones. Masses may be of any tone from black to white.

Modeling. The appearance of relief, or roundness, in an object, produced when the lighting is such as to bring out the contours of its surfaces.

Notan. This is a Japanese word, signifying "dark, light," that has come to be extensively used by western artists and critics, as it expresses better than any one word in our language the play of tone-gradations in a picture. The



"MLLE. RUBINO" (GUM)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

expression, "light and shadow," though sometimes used, does not mean the same thing, since it implies that the gradations present are produced only by the action of sunshine and shadows, whereas differences in the tones of the various materials included in a composition also affect the range of gradation and its distribution. *Notan* arrangement, or effect, covers the tone-gradations of a composition, however produced.

Pattern. While the suggestion of depth and the third-dimension of objects may be present in a picture as a sort of optical illusion, the composition of a picture must be regarded as primarily an arrangement of lines and of light and dark areas upon a flat surface. The grouping of such lines and areas naturally form a "pattern"—hence the term.

Planes. In the average scene objects lie at various distances from the observer. All those situated the same distance from the eye are said to be in the same plane. Thus, the material used for a picture falls into a series of planes, ranging from the nearest objects included to the parts that form the sky-line. The planes are commonly divided into three general groups, called, respectively, the "foreground," "middle-distance" and "distance." These terms merely serve to indicate the relative position of the material in a particular



"THE DANCE" (SINGLE GUM)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club



"SUSANNE KEENER"
(GUM PALLADIUM)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club



"THE COQUETTE"
(BROMOIL)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

composition, rather than any fixed distances from the observer. In a forest interior, for example, the "distance" might be located but a few hundred feet at most from the observer, owing to the shut-in character of the subject, whereas in a seascape or open landscape the "distance" might be several miles away.

Sky-line. The boundary or dividing line between terrestrial parts of a scene and the sky, as, for instance, the outlines of a mountain or a mass of foliage against the sky. Not interchangeable with "horizon," as the latter word is descriptive only of the junction between the sky and a far distant plain, or expanse of water.

Spacing. The relative separation of each unit that enters into the design or pattern of the composition.

Spotting. A term sometimes applied to the distribution of light and dark tones in the picture. Don't confuse this with "spottiness," for a picture that shows good "spotting" is not spotty!

Tonal Quality, or Tonality. Though photographers often speak of "toning" a print, this is quite a different matter than that of *tonal quality*. The latter term refers to the general effect produced by the combination of tones or gradations that compose the image. If these represent a limited range of contrast and one gradation runs softly into another, one may say the picture possesses soft tonal quality. From its frequent use as an adjective in describing



"DESOLATION"

(CHLORIDE—printed through from back)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

such compositions the term "tonal" has come to be associated exclusively with soft effects, but this is too narrow an interpretation, since the tonal effect may be harsh as well as soft, or anything between these extremes. Painters frequently make use of the word "tonal" in connection with the color-scheme. Used in this sense, it means that the effect of a single color pervades or dominates the entire picture—all other colors that are present having their hue altered through partaking, in some degree, of the principal color, with the result that every portion of the subject appears enveloped in light of a single tint.

Tone-Scale. All subjects exhibit a series of tones or gradations. These may be few or many, light or dark, but all bear a definite relation to one another. If, for convenience, we designate as the brightest tone the strongest lighted surface we can very well look at, such as a surface of snow in full sunlight, and take for the darkest tone a shadow so black that no light nor detail is visible therein, we shall have the two ends of a scale, which may be divided into as many arbitrary notes or gradations as seems desirable. Whatever series of gradations appear in a given subject will then correspond with certain gradations upon our *tone-scale*. In translating nature's tones in an image upon paper, the brightest tone possible is, of course, the white of the paper, and the deepest dark the blackened silver, or pigment, that forms the image. These extremes, together with as many gradations between as the eye can distinguish, constitute



"CLEARING THE ROADWAY" (BROMIDE)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

what may be designated as the *pictorial tone-scale*. If when looking at a particular scene one decides that the darkest part is midway between the extremes of the natural scale, and the brightest part quite near to the highest light, then, to represent this subject correctly upon paper, one must have the darkest tone in the image one that is half-way between black and white, and the high-light near to, but not, white paper. The range of tones presented in the subject fixes the length of the scale employed in a given case. This gives rise to such expressions as "long scale" and "short scale" subjects. The position in the scale of the tones employed determines the "key" of the picture. See *Key*.

Values. This term covers, collectively, all the tones present in a picture and their relationship to one another in the tone-scale. In a sunlit snow-scene, for example, the snow in sunshine would usually be the highest-light, next would come the blue sky, then the cast-shadows upon the snow, followed by the darker tones of trees, houses, etc. If all these gradations are represented in their proper order, and at proper intervals in the scale, a critic would say that the picture shows "good values," or that the "relative values" are truthfully rendered. If, however, the sky was shown as bright as the snow in sunlight, or the darker tones represented by blackness in the image, the verdict would be "false values."



"THE CALL" (CHLORIDE)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

THE MATTER!—C. H. CLAUDY



WHAT is the matter that, with such myriads of cameras and such legions of photographers, so few rise to eminence in the art or so few really fine pictures are made?

The question occurs to many; it occurs to a large number of camera users. When it is asked insistently enough by a photographer he usually also gets the answer; eventually he makes fine pictures! For "the matter" is that same matter which prevents the hundreds of thousands of golf club swingers from going around under a hundred; it is the same "matter" which keeps the ranks of the first ten tennis players of the country a place to be dreamed about, longed for, and rarely attained; it is the reason we have a million pianists for every one who is a concert performer; why our learned men are few and scarce, our great statesmen to be numbered on the fingers of our hands.

"The matter" is mediocrity of effort!

Almost any one can, if he starts young enough, become a fine golf player. Given proper instruction, sufficient practice and a love of the game, and any young man not a cripple can learn to give the top-notchers a run for their money. Any child, who loves music, can be taught to be a fine performer on any instrument, if there is enough time and effort to put in the learning. Any educated man can be taught statesmanship, if he loves it and will study. And any one, with average intelligence, can become a fine photographer and a maker of fine pictures if he loves it and will work.

The real "matter" is that they don't love it enough! It is a common thing to hear a man say "I wish I was rich. I'd love to have a million dollars." But what he means is "I'd love to have some one make me a present of a million dollars." If he meant "I really want a million dollars more than anything else in the world," he'd go out and hustle for it. He wants it, but not badly enough to work for it! He prefers ease, pleasure, getting married, playing golf, to the sacrifices necessary to make a star money-maker.

It's the same way with photography. Any one can be a fine photographer who will work for it, but he must want it badly enough to make the sacrifices.

Photography in its first stages, as far as the average beginner is concerned, is almost fool-proof. With the standardization of methods, material and apparatus, any child of ten years old can make fairly decent photographs. Any child of ten can start a phonograph or pump a player piano, too, and produce fairly decent music. Any child of ten can manipulate a radio, but that doesn't mean he can build one, or interpret music on a player piano, or build a phonograph!

The "matter" is that most of us are content to follow the red light and the sensitive film as far as they are easy to follow and no further. We press the button, mix the prepared developer, use the tank, let some one else do the printing and then long for better pictures! It isn't sensible, but it is very human!

There is, of course, a comfortable middle course which can usually be



"ALONG THE BROOKLYN WATER FRONT "
(BROMIDE)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club



"GOING TO CHURCH" (BROMOIL)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

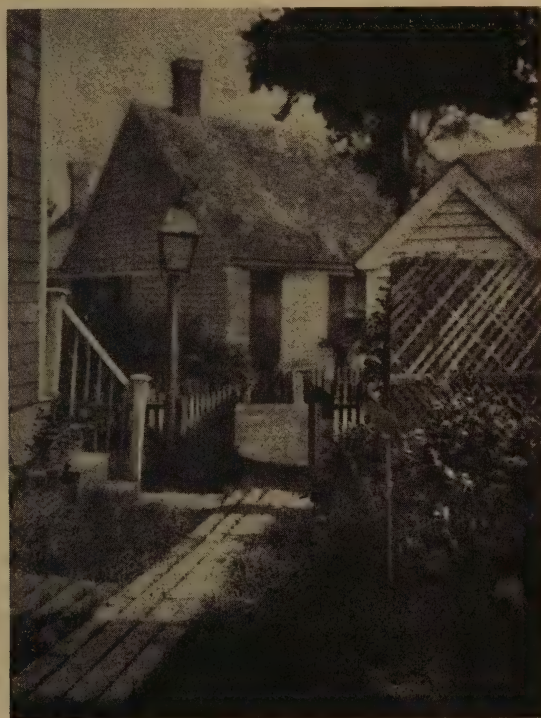
found between two extremes. It is not essential to the happiness of most men that they play the best game of golf in the world, play the piano better than any one else, excel Midas in wealth or Marshall Field in business. It is not essential to the photographic happiness of most of us that we stand at the very top of the profession—for being a highly skilled amateur is a profession!—or make the very best photographs in all the world. Somewhere between this extreme and the “Oh, that’s good enough” policy of the mere presser of a button and another do the rest is the middle ground of successful skill and competence of result.

Photography is a combination of (1) optical science, (2) chemical science, (3) digital skill, (4) knowledge of art.

To occupy the middle ground, it is essential that we have some learning in three of these departments and proficiency in the manual end.

We can only obtain the knowledge by study.

There is no other way. We cannot get it by experience; all the experience in the world will not teach a man what makes a lens do the way it does, why a developer acts like a developer and not like a fixing bath, or what reasons underlie the action of sensitive salts on film or paper. Here familiarity with the products of artists may teach us the difference between the good and the



"A STREET IN PROVINCETOWN" (BROMOIL)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

poor, but never the why of that difference. Man is not so constituted that he can dig out for himself all of a science or all of an art. Both science and art are the product of years of study, experiment, effort and thought, of thousands of men. Life isn't long enough for any one man to get it all by his unaided efforts. Consequently he must learn of others, and that is study.

Hence, for even the middle ground, if we would get rid of what is "the matter" with our photographic efforts, we must make up our minds that we will study in three departments of human knowledge and practice in the fourth—digital skill.

It will not suffice that we buy: Item, one book on lenses; item, one book on chemistry, and item, one book on art, and devote three evenings to reading each one through! If learning were so easily come by, it would be of small worth to have! No, we must get our book—books are better—and lay off a course of study, which we agree with ourselves to follow to the end. We can make the end a month or a year away and the course as narrow or as broad as we please, but without a definite course and a definite time, we won't accomplish much.

"But that means work! Photography is a pleasure—I don't want to make a task out of it!"

If that sentence is evidence of your attitude, be warned in advance and stay comfortably in the class of those who are content to do little and produce less. The better picture is not for you! If learning the real inside of what



"GLASGOW FOG" (BROMIDE)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

you do is labor, don't do it. Better go play golf—in a hundred and fifty strokes to the round!

But it will not be work if you have a real interest in making your pictures really worth while. Your knowledge of optics will give you an insight into drawing and perspective, without which no graphic artist can hope to succeed. True, the camera does the drawing for you, but you have so to direct it that it draws what you want it to draw. If you don't know how and why it draws, how can you make it do your will?

Your chemistry will teach you the why of sensitive salt and developing reagent. It will show the reasons behind the fixing bath, the color of print, the process of reduction and intensification. Knowledge of why an effect is obtained is knowledge of how to obtain the effect.

And it is the study of art which will teach you what the effect is, which the other knowledge has taught you to get. By a knowledge of painting, drawing, color, light and shade, balance, tonality, unity, etc., you will know a picture from a mere map, a pleasing composition from one which jars. You will learn from this study how to express your ideas in line and tone. And any picture is, after all, but the expression of an idea, unless, indeed, it is an accidental success, of which there are many made with no concomitant right of the maker to feel pride therein! Doubtless baby is happy if he succeeds in putting two fingers on two keys of the piano which produce a harmony instead of a discord; maybe the kitten is also pleased if her paws rest on no discordant notes! But to neither is the right given by accomplishment to feel proud!

As for the digital skill, that is a matter of practice only. There is nothing so difficult in the manipulation of plate and paper, chemical and bath, lens and



"THE SCALLOP SEASON BEGINS" (GUM)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

camera! Any one can, if he will, but no one can merely by willing! He must practice, practice, practice. Particularly is this true of such dainty departments of the art as retouching and spotting, mounting and dodging, the registry of two color films or the manipulation of bichromate or carbon paper. It is perhaps, the easiest of the four subjects encompassed by photography to master, but that is no reason for neglecting it for the other three.

"The matter" with our pictures is not really a "matter" with them, but with us. It is we who are inefficient, lazy, self-satisfied, too proud to learn, willing to let well enough alone. "The matter" is a state of mind, an inertia of the will, rather than any inability to do better. We who ask ourselves, "What is the matter with photography in general and my photographs in particular?" should rather ask, "What is the matter with people in general and me in particular that I am unwilling—that people generally are unwilling—to take the trouble to do better, when the way is so plain, so easy, so enjoyable, and open to us all?"

STEREOSCOPIC PHOTOGRAPHY



HAT fickle dame "Fashion" seems to have decreed that it was her prerogative to taboo stereoscopic photographs, to relegate these once most popular and delightful pictures by the camera to disuse. Yes, *delightful* is the word; for there are still a few survivors of those days who remember when the mahogany stereoscope occupied a distinguished place in the library or parlor, when the vision was regaled with the contemplation of beautiful gems of art, grand collections of scenery, views of palaces, interiors, picturesque landscapes, artistic groups, by the best photographers of the world. We call to mind some of those exquisite Scottish pictures of G. W. Wilson, the features of English city life by Valentine Blanchard, and the superb French and Continental and Oriental views of Levy and Laschenel of Paris. How much more enjoyable, how nearer the actual, were these pictures in natural relief, seen through the binocular, than the single picture, where imagination has to mend the shortcomings incident upon a plane surface projection.

No wonder such photographic presentations were popular. Indeed their excessive popularity may be the reason for the ban of fashion. To meet the great demand, art was cheapened, with the inevitable result. The world was flooded with inferior and imperfect work and stereoscopes were a glut in the market, and cultivated people had enough of the two-fold blazon of bad pictures on gorgeous yellow or red mounts. There was a spasmodic renaissance of stereoscopy about twenty years ago and one had sanguine anticipations of its coming into its own. Good work was revived and hopes were high, but then came in the new enchantment, the cinema with its marvel, and with it the decline of the stereoscope. It is so quiescent now, that we might say it is a lost art. Only the other day, at a rummage sale (a sale got up for charitable purpose), among a motley collection of things got together, we saw one of the



"AN INDIAN MAID"
(BROMOIL)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club



"IN GRANNY'S CLOTHES"
(BROMIDE)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

old time upright stereoscopes, with a number of glass positives, offered for sale for \$1.50, entire lot.

Fortunately, we were in time to enlighten the lady attendant as to its value, and what is stranger still, to inform her as to its use. Do you wonder then that we receive letters from subscribers to give them information about the subject?

We hope it is a sign of renaissance. But from a reading of some of the letters, we discover that the theory of stereoscopic relief is far from being understood. Therefore, we think it advisable to publish something about the subject, even if we have to go into detail upon it, which might seem superfluous to older photographers who have acquaintance with the theory and perhaps the practice, too.

We believe there are many of our readers who will welcome a few plain words relative to practical work.

A comparison between the eye and the lens of the camera is often made to illustrate the formation of the projected image of external things. The retina is made analogous in function to the effect made by the lens upon the ground-glass. But there is a difference in the presentation on the focusing screen and upon the vision: the image on the one being inverted, on the other we see as in nature, right side up. This inversion must take place upon the retina, because the rays of reflected light from objects must first pass through the crystalline lens of the eye and this lens in structure, as far as physical behavior is concerned, conducts itself as an ordinary glass lens. Its form and function



"THROUGH THE TREES" (BROMIDE)

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

are identical. But there is this difference, the eye is a vital machine, controlled by mental operation and capable of being influenced by the exercise of the mechanical properties. It is subject to the will of certain muscles, which have ability of co-ordination, which lengthen or shorten (involuntarily, they say, but really subject to influence of physical stimulus) the focus of the crystalline lens.

This function of the eye of accommodation instantaneously enables it to sharpen perception on any desired plane of vision, at varying distances from the place of observation, from say, 8 to 100 yards.

This alteration of focus (as we would say in using a lens) is effected by the complex system of little muscles (ciliary muscles).

It is evident that the curves of the crystalline lens must therefore be changed under this muscular activity. For near objects they necessarily make this lens of greater convexity or shorten its focal length; while for distant vision, its focus is lengthened by the flattening of the surfaces.

So you see, that the eye, subject to the will, indirectly acted upon by mechanical stimulus, from a photographic point of view, becomes at one time a short-focus lens, at another, a long-focus one, without moving from its position in the optical system of the eye. It merely automatically undergoes alteration of form.

It is needless to show how different is the performance with an optical glass lens when we want to get any one plane in sharp focus. So you see that the comparison made between the glass optic and the organic optic is different in its performance of image projection.

But we must take something more into consideration in comparing the organic and the mechanical system of visual perception.

If the eye vision is analogous to camera presentation, there is this difference. We have two eye cameras, directed at the object, two distinct pictures, one on the retina of one eye and the other picture on the retina of the other eye, yet our mind takes cognizance of only a single picture (provided, of course, our physical condition is normal).

Now, how is this possible? In what way do our eyes persuade us that we see only a single view, when logically, we know that two images of it must be projected? Why has not nature made us with a single eye like the Cyclops? We shall try to make this clear to you in a paper on stereoscopic vision, and explain to you the phenomenon of binocular vision, which is the means by which our enjoyment of the beauty of nature is materially increased, the foundation of all stereoscopic work.

BINOCULAR VISION

In ordinary vision, the object which is seen is the result of a two-fold presentation of it, an image of it on each eye, but each from a slightly different angle of view, conditioned by the angular distance between the two eyes. You may readily convince yourself of this by observing an object at some little distance, first with one eye, then with the other, and noting the area taken in with each individual view and the difference from either when you look at it with both eyes simultaneously. The combination of the view of the two objects



"THE OLD LANDMARK"

SOPHIE L. LAUFFER

From the Lauffer Exhibit at the Detroit Camera Club

gives you a suggestion of the relief of the thing. You appreciate that it has three dimensions, although both images are projected upon a plane surface.

Scientific men, from the time of Da Vinci, if not earlier, have bothered their wits to explain how we see singly, and see things right side up, instead of inverted as shown by the glass optic; but their explanations are not wholly convincing, because psychology seems as much involved in the discussion as physiology. However, it is not necessary to go into any discussion relative to the marvelous phenomenon on which so much of our enjoyment of Nature depends, but we may simply state that the eyes are in constant motion, and that they realize distance, depth and solidity by the greater or less convergence of the optic axes. The greater the convergence, the greater the relief; the greater the parallelism, the less the relief. Let us stop here, before going further into the subject, to inquire, what does the observer of a stereoscopic picture mentally receive when the two views of the one subject are simultaneously projected on the receiving surface of his vision? This consideration is made necessary, because to many stereoscopy is an unfamiliar subject.

A correctly made stereoscopic photograph, when viewed in the stereoscope, gives us a presentation of the original, recreated as it were, minus only movement and color, and these features are within the possibility of accomplishment for further increasing the charm of the exhibition. Atmosphere, distance, space value, height, depth, breadth are presented, so that one has a mental conception of the possibility to verify observation by the touch. In a plain photograph, however well presented in terms of art, the artist must call upon the imagination to give a mental perception of depth, relief and atmosphere. The artist has recourse to an illusion to give an idea upon a flat surface of two dimensions, the significance of solidity, the conception of the third dimension of matter.

This eulogy on the stereoscope is not inspired by personal enthusiasm, for let us say, the fascination is engendered only by the highest class of work. Inferior work, or work carelessly executed, is most displeasing and results often in giving a falsity of presentation of Nature, apparent even to the untrained eye.

The deluge of bad work precipitated upon a long suffering public, doubtlessly was the cause of the decline of interest in this beautiful form of photographic art reproduction. It shall be our purpose therefore in the following pages upon stereoscopy to guide the votary to the accomplishment of the highest grade of work only.

Our experience with the lady at the "Rummage Sale" induces us to venture to suppose others, equally cultivated, may also be ignorant of the stereoscope and its use.

The stereoscope is an instrument for conveniently viewing the stereoscopic picture. We say "conveniently," because it is possible to view the two subjects simultaneously with the naked eyes and have the effect.

The first stereoscope was a reflecting instrument, the invention of Wheatstone. It consists of two plane mirrors, so adjusted that their backs form an angle of ninety degrees with each other. These mirrors are fixed by their

common edge upon a horizontal board in such a manner that, upon bringing it close up to the eyes, the images on the respective mirrors are seen, each eye seeing the image reflected from its position at the two ends of the instrument in a different mirror.

The two reflected images coincide at the intersection of the optic axes and form a single image. The advantage of this form of instrument lies in that pictures of any size may be adapted to it. It has been used effectively for stereoscopic views of X-ray pictures, which are not adapted for the ordinary lenticular form of stereoscope invented by Brewster.

His instrument, the basis of all our modern adaptations, consists of two semi-lenses, placed at such a distance that each eye views the picture opposite it through the margin of the half lens, or (as now constructed) through parts of it equidistant from the margin. The semi-lenses correspond with the pupils of the eyes. In good instruments, the distance is capable of accurate adjustment for individual eyes. In rigid stereoscopes this fixidity is often accountable for want of the individual's personal enjoyment.

When we view, in this way, the two pictures, we are actually looking through two prisms which produce another picture of each original, and when these secondary images combine or coalesce, we see solidity presented. But in order that they *may* coalesce without any strain of the eye, it is necessary that the similar parts of the two photographs be equal to twice the separation produced by the prisms.

For this purpose, measure the distance at which the semi-lenses give the most distinctness of image and having ascertained by using one eye, the amount of the refraction produced at that distance or the quantity by which the image of one of the pictures is displaced, place the pictures at a distance equal to twice that quantity: that is, place the pictures so that the average distance of similar parts in each is equal to twice that quantity. If this is not done correctly, the eye of the observer will correct the error by making the images coalesce without being sensible that it is making an effort to do so.

The object of the camera therefore is to place the camera in the position of the eyes and thus get the two images as respectively seen. This of course may be done by a camera with a single lens by adjustment of the lens. You take one picture, then orientate the camera about twenty degrees and take the other picture—but it is more convenient to employ a camera provided with lenses of identical foci, a binocular camera as it is called.

There are many very excellent ones to be had, but they are not conspicuously advertised because of the little demand for them. Of course it would be possible to bisect a lens and use each half in taking the pictures, but I doubt if it has ever been done. It would not be a paying proposition.

The most economical plan and the one most convenient is to get a camera especially rigged for the purpose.

SELECTION OF SUITABLE SUBJECTS

There is a wide field for selection in subjects adapted for stereographs, nevertheless there is a class particularly adapted for presentation for effect.

Some few suggestions may therefore be appreciated for guiding one accustomed only to the methods applicable to practice with the monocular camera. Many a natural scene, not regarded by the pictorialist as worthy his special interest, because his experience has taught him that it does not compose well, when viewed on the flat surface in the single view, yields a most enjoyable subject, seen stereoscopically.

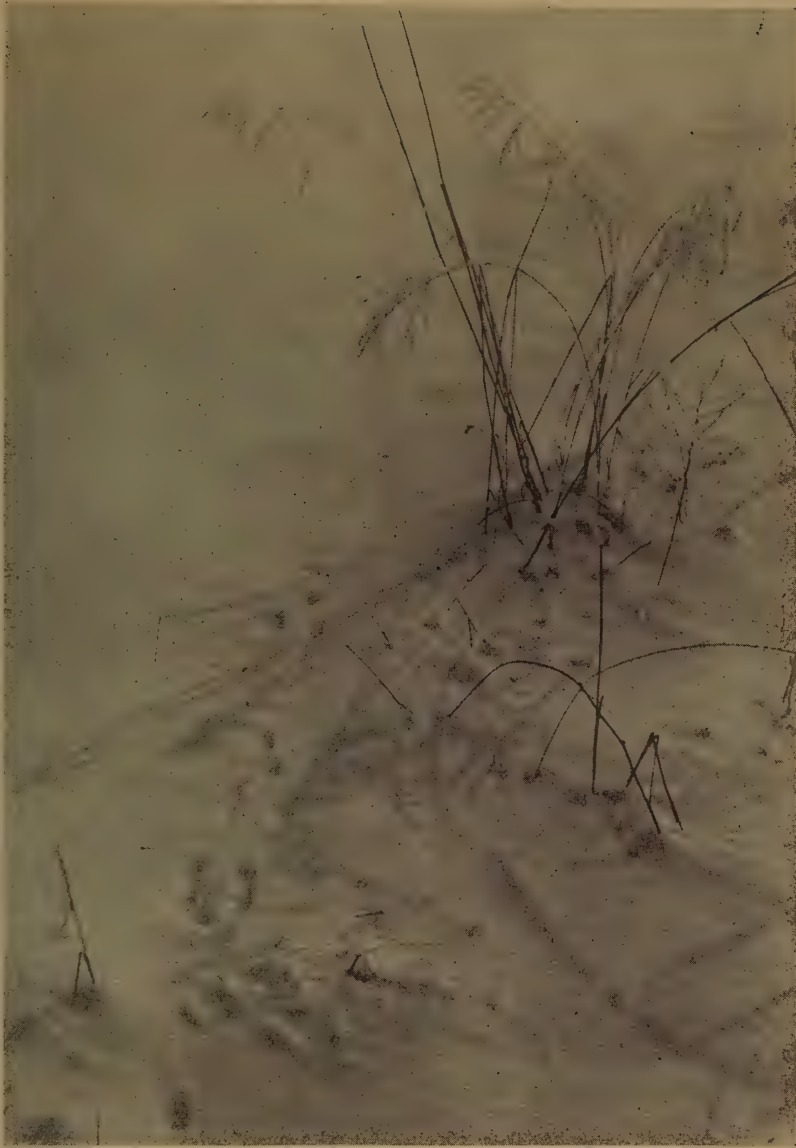
And this unexpected presentation is due, essentially to the relation of the different planes of the subject. You are ever reminded in talks on art of the importance of consideration of the various planes of a picture, of the necessity of their differentiation to give suggestion of depth and atmosphere, but valuable as a pictorial asset, this separation of planes may be practically ignored in some subjects without detracting the least from their artistic significance when viewed in the flat, but, seen through the stereoscope, all such seem "flat, stale and unprofitable" and devoid of pictorial effect. It follows, therefore, that some judgment in discrimination must be exercised, and it may be ventured upon to advise avoidance of subjects of pronounced delicate values so effective in diffusion photography. The realism demanded of a stereograph connotes expression of considerable detail, inasmuch as this detail does not obtrude itself upon the vision by reason of the coalescence of the two images; just as in nature our view of minutiae is invariably modulated by our binocular perception of it, while the glass optic, in its one eye view of it, remorselessly registers everything, compelling the artistic instinct of the photographer to have recourse to means of suppression, to bring his conception in conformity with the avouch of his artistic visual perception.

So you see the unwisdom of trying for effect with stereoscopic art work by intentionally throwing the subject out of focus. Open landscapes or seascapes or any subject where interest is confined to any one plane fail if used for binocular effect. As a rule, work suitable for a long focus lens is unsatisfactory for stereographic photography. And in the same category may be put a good many instantaneous subjects confined for interest to the single plane of observation. But do not interpret this exclusion to relegate all instantaneous subjects to the discard. Street scenes, with moving objects, often present charming effects, but the picture of a single moving figure or dancer would not show satisfactorily, might even exhibit distortion. With this minor restriction, you nevertheless must see that the field of stereophotography is a more extended one than that of monocular work with the camera.

AXIAL CONVERGENCE

We speak of the parallax of natural vision, and it is necessary to consider this to bring the binocular view which the lenses have in conformity with what normal eyes see.

We can get at this subject best in a roundabout way. If we look at an object at a considerable distance from our stand point of vision, the rays entering the eyes are practically parallel and the impression formed is almost, if not quite flat, practically no relief. We note this flatness of presentation when we come to make a telephoto view of a house, in the distance, which from a close



"WINTER"

J. H. FIELD

up point of sight looks somewhat like a cubical block, but at a mile away we are at loss to say whether it has any relief, inasmuch as it shows only the look of a square fence. This is one of the artistic objections to employment of the telephoto lens.

An object at some distance does not give dissimilar views of itself to each eye, as it would close up, a few yards or so from the point of view, our eyes are so formed that they can accommodate themselves to varying distances. The flexible crystalline lens is controllable by a system of complex muscles and may at will be converted into a lens of varying foci, the axial convergence by the power of accommodation lets us see in natural objects their relief.

Now, the stereoscopic camera cannot be so constructed by any mechanical means to do this, it has neither power of accommodation nor axial convergence and the degree of separation of its lenses, corresponding to the distance between our eyes, gives an appearance of excessive relief. The lenses see too much around the objects close up to them. Hence the necessity of some mechanical device to adjust the distance between the two camera lenses. The nearer the object to the camera, therefore, the less the separation demanded, the more remote the object, the greater the separation, so that when a stereograph is taken of objects immediately in front of the camera, the separation needs be only two inches or even one and one-half inches between the two lenses.

There are extreme cases where the separation of the two lenses required feet instead of inches. Of course no single camera could be used in such a case. The majority of subjects, adaptable for stereography, may be put in the category of "nearness," and it is just here that the significance of adjustment of distances counts. A separation of a fraction of an inch makes all the difference between naturalness and exaggeration of relief.

But in our natural vision, thanks to the automatic action, we never really notice any exaggeration of relief in things reasonably close up to our vision. The parallax angle of our eye averages $2\frac{1}{2}$ inches, so you see if things close up are taken with separation of three or more inches between the lenses, the mental perception of them is materially different from what we are accustomed to. The things look unreal. It is patent to you that we cannot take as guidance for separation of the lenses a distance approximating the normal distance between our eyes, and so we must experiment somewhat to determine the proper distance, but there is some compensation, inasmuch as we can get with the stereoscope relief of things at a distance denied our natural vision. Only there is a danger here of overdoing the trick and showing up something we appreciate as not natural, because we never see things that way.

The making of the negative involves the same methods employed in ordinary exposures. It is essential that the twin lenses should be matched, so as to secure identical pictures and the positives of the same intensity, etc.

One of the causes why many amateurs hesitate to engage in stereoscopic photography is the supposed difficulty attending the operation, especially in the cutting out, transposing and centering of the right and left sides of the print, but the work soon becomes automatic after a little experimentation and



"THREE BOATS"

ALEXANDER KEIGHLEY, F. R. P. S.

besides it is easy to devise simple methods which cut away the troublesome part of the operation.

It is possible to print, in direct form, ready for mounting on the card without need of the intervening steps of cutting and transposing and centering of the two halves of the picture.

The toning and fixing follows as usual, but beyond this nothing is required in the print and it is complete and as easily handled as the single print.

There are special mounts made for stereoscopic pictures with guides marked on them, with cut out forms of different size openings suitable for all dimensions and shapes. Of course these labor-saving devices are not intended to serve as premiums for carelessness. The cutting and mounting requires taste and judgment, because if not properly done, the result is useless.

In architectural views, even if the picture has been taken with due observance of the rectitude of the verticals, care must be taken that the verticals of the picture must be parallel with the sides of the mount or the presentation in the stereoscopic view will suggest a falling of the lines to one side.

Metal cut-out frames are used for the purpose. Another point requiring attention is the height and width of the prints. In a good many commercial pictures the stereographs are too wide for comfortable viewing, they cause a strain on the eyes which is fatiguing if not hurtful.

For comfort and best effect in viewing, the limitation of the width to $2\frac{1}{2}$ inches or not beyond $2\frac{3}{4}$ inches has been generally adopted. As to the height of the picture, however, no such restriction is imposed and limitation below four inches or even five inches is unnecessary. At present the average height is about three and one-half inches, but a good many of the subjects so prescribed would look better with more height, especially architectural views. The eyes do not seem to experience any strain even with six inches of height, and often height is a consideration. Of course this applies only to viewing in a first-class stereoscope with adjustments accommodating to idiosyncrasy of vision. The ordinary cheap stereoscope might demand special limitations. Stereoscopic negatives should invariably be properly exposed and developed for softness, so as to keep down over contrast of light and shade and too pronounced intense high-lights. Indeed, we might venture to say a slight tendency to flatness, which would be tabooed in an ordinary photograph, may be indulged in. What is called chalkiness is fatal to a stereograph.

Sometimes a little toning-down of high-lights may be necessary. A good surface print, in fact, one with gloss gives best results, because when the surface is matt, the magnification by the stereoscope is apt to show unpleasant rugosity of paper. The modern gelatine or collodion papers are admirable for stereographic purposes. Warm tone prints contribute to the effect. Absolute uniformity in the tone of the two pictures is not necessary. A little difference in tone is not perceptible in the combination. In conclusion, we may say it is strange that a desire for the return of the stereoscope is not manifest. The eminent service it is capable of, outside the wide field of pure enjoyment it affords, must eventually make its renaissance a necessity.

LARGE *versus* SMALL CAMERAS— EDWARD CONNER



ILL the controversy between advocates of large and small cameras ever cease? Probably not. Both will always have their defenders, and both will always be used. Yet even though this is true, no reason exists why small cameras should not replace large ones under certain conditions, or why the man who photographs for pleasure alone should be burdened with an apparatus heavy enough to require a truck for transportation when a smaller one will do quite as well.

For some purposes large cameras still seem necessary, even though the small instrument has reached a degree of perfection in negative making which frequently seems almost incredible. Sometimes large negatives direct from the object are required, and the enlarging processes have not yet been perfected to the degree required to make perfect reproductions from small negatives, consequently the huge outfit must be carried, and whatever pleasure might accrue from the trip is greatly lessened or wholly destroyed. Thanks to the Kodak, photography has ceased to be a burden for amateurs as well as professionals.

In selecting the small camera for ordinary use, one should be guided by the purpose for which it is required. For long trips, nothing perhaps is better than the roll film cameras. They combine efficiency with portability, and the films are so light and so compact that it is almost no trouble to carry them. With a developing tank the work of development is simplified and the bother is so reduced, or so nearly left out, that photography becomes a pleasure. This applies to all roll film cameras using the same size films. The one who desires to enjoy his photography should experiment with these cameras. He will be surprised at their efficiency and the ease with which they can be manipulated.

When considering size one should have regard for the purpose for which the pictures are wanted. The popular 4 by 5 is always desirable. The post-card size, $3\frac{1}{4}$ by $5\frac{1}{2}$, is a good size. The direct prints from these negatives make good pictures for either mounting or preserving in an album. If post-card views are wanted, these negatives are the exact size required.

Perhaps the most desirable of all is the $3\frac{1}{4}$ by $4\frac{1}{4}$. The proportions of this size are more nearly correct, thus making a more symmetrical picture than either of the other sizes. The prints are large enough for preservation. The negatives are the correct size for lantern slides, and by matting the card, good post-cards can be made. A smaller camera has been brought out recently, or rather, an improved form of an older make, the popular No. 1A, which now has rapid rectilinear lens and automatic shutter, and thus all the elements of larger and more expensive cameras in an extremely condensed form. The size of the film is $2\frac{1}{2}$ by $4\frac{1}{4}$, a little odd, yet possessing artistic possibilities sufficient to make it attractive and supplying good prints for preservation, or enabling the photographer to utilize his negatives satisfactorily in other ways. Any of these cameras can be fitted with anastigmat lenses and the highest grade of speed

shutters, placing them upon a plane of efficiency as high as the more expensive large instruments.

For extra speed work cameras of the reflecting type are used, the smaller sizes, $3\frac{1}{4}$ by $4\frac{1}{4}$, or the 4 by 5, being the most popular. But these are costly instruments, and do not appeal to the average amateur, who wants something comparatively inexpensive, yet sufficiently efficient to make good negatives. High-speed instruments which cost a good deal of money are scarcely wanted by the amateur who wants pictures merely for his own amusement in most cases, or as records of a trip he has made, or home portraits of his friends.

Other arguments in favor of a small camera will readily occur to one. Perhaps the most important is the smaller expense of operation. Films or plates cost less and the entire expense from purchasing the camera itself to the finished picture is less. And with most amateurs, the question of expense is worth considering. To practically everyone it is a matter of importance, and if good pictures can be obtained at a reduced expense by using a small camera, this portion of the problem is easily solved. Rightly handled the small camera and its product will yield quite as satisfactory pictures as the large one, but of course it requires practice to give the facility.

There are all sorts of advice offered to the worker with the small camera, and he is told he must do this or that to insure good results. He might as well forget a considerable proportion of this advice and begin to investigate for himself. He must practice. That is the main consideration, and unless he does practice he will not succeed in producing good pictures. Some of the small cameras have plate adapters and can be used with the ground-glass, but when roll film is used, it is impossible to focus and one must learn to use the finder. On the better grades of small cameras these finders are sufficiently accurate to record with substantial certainty whatever the operator may want to get, but it is always well to make a test and be reasonably sure that the finder is accurate before attempting anything that is serious.

If one gets an occasional negative that possesses some particular interest, or is pictorial, enlargement is possible, and the good lenses supplied with the small cameras mentioned permit any degree of enlargement without distortion or blurring. Enlargements are better than the small prints, because in the process of stretching they acquire softness and the range of tones is frequently improved.

After all, the large picture is what is wanted, and the amateur who has a small camera can have large pictures at will, but he gains in this respect—not every negative is sufficiently good to be enlarged, hence he has no expense for large plates or large paper for printing unless his negative is worth the extra cost. Every worker with a small camera should exercise just as much care in composing his pictures as he would if the plate were a large one. Because his film costs only a few cents for an exposure he should not waste it, but he should study his pictures carefully, look to the arrangement and the lighting, and never open the shutter until he is reasonably certain the result will be pleasing.

If he does this, he will advance just as rapidly in artistic development, while

his negatives will be worthy enlargement, or will transform into lantern slides with pleasing results. It is quite as important for the cultivation of one's appreciation of art that these small pictures be made with the utmost care. The hand camera is such an easy instrument to manipulate that sometimes the worker forgets this admonition and wastes his negatives, but he should work with quite as much restraint as when using large plates. If he does this, he will enjoy photography more and more and will seldom be seen without his small camera.

A certain amateur of the writer's acquaintance worked for many years with an 8 by 10 outfit. He is an excellent workman, and has won numerous prizes in various competitions. For a long time his friends argued with him to abandon his heavy outfit, particularly when out on photographic trips. He quite as steadily refused; producing his beautiful 8 by 10 plates in comparison with the small plates or films made by the others as indubitable evidence that his contentions were correct. And frequently the party who went with him was forced to admit that he was right to a certain extent.

One day, when going on a long trip, something happened to his large camera, and he was forced to take a small one. The freedom from hard work to which he had been accustomed and the resulting negatives, which were all good, convinced him that his friends' arguments were correct. Now the large outfit seldom goes into the field. It is used only at home, for portrait making, or something nearby that does away with the necessity of carrying it.

This gentleman's experience has been duplicated many times, and each time the small camera gains a friend. With the perfection of the modern small apparatus, including anastigmat lenses, there is no apparent use for the large camera, excepting for some special occasion. On the contrary, it is becoming more and more obsolete and will shortly be relegated to galleries for the benefit of professionals and others who for one reason or another must have a large apparatus.

GOOD PHOTOGRAPHY AND ARTISTIC PHOTOGRAPHY



HERE seems to be a current opinion, prevalent with photographers, that there is a difference between a good photograph and an artistic photograph. A good photograph, we are informed, is an impression from a technically perfect negative, irrespective of the character of the subject as a thing of art, whilst an artistic photograph is something made by photographic means, which exhibits the subject in terms of esthetic composition. What do they mean?

The surest way to get to an understanding of a subject, is first to get to a clear notion of terms employed. Unfortunately, here, we encounter, at the start, a confusion of tongues. Neither side in the disputation can give a reason for their assumption.

This vagueness of conception, concerning the "good" and the beautiful, is responsible for the plethora of the so-styled artistic work exhibited at salons and in the magazines, where each self-appointed artist arrogates the right to be a law unto himself, and hence his prerogative to transcend all prescription in matters artistic. Nothing can be more obstructive to progress in artistic photography than an attitude like this.

Truth and beauty are not antagonistic, but correlative. It is unnecessary to enter into the much vexed and needless controversy as to whether photography be a fine art; sufficient for the present is, to say what is now indisputable, that anyone possessed of artistic instinct is capable of selecting from nature what is best suited to art, and one devoid of such intuitive perception, will be blind to artistic manifestations.

The art is the man. What then constitutes the difference between what is simply true to fact, and what gives a revelation, a new birth, to what to ordinary vision is accounted the common-place?

Without venturing upon giving a succinct definition of what is artistic, a feat we are not presumptuous enough to think ourselves capable of, let us go for help to a study of some of the works of artists who have "taken the world's great hands" and whose merit none disputes. Let us take with us in our efforts in the direction of art, and compare what we do with what they have done. What do we note as general in all the great works?

We perceive that certain features prevail throughout, however varied the character of the subject by the different artists. (Please let us exclude, here, any consideration of exponents of any particular cult, however great they may be, and let us confine ourselves to what is now considered work of conventional painters.) We find correct composition, that is, a regard for the pleasing distribution of lines and masses of light and shade, harmonious balance of parts, a consistent scheme of correct lighting, that is, a natural presentation of light, an indication that the illumination comes from some definite direction and is consistent in its distribution throughout the picture. But this is not all which is essential to a picture, inasmuch as adherence to such rules may be found in many a painting by inferior artists, and, indeed, in photographs which are not particularly meritorious.

The "artistic" involves something more than observance of set rules; it must besides exhibit the idea of individuality, and the ability to do this is not denied the photographer, provided he can control the actual to expression of the "mood," he has in the selection of the elements presented for co-ordination. The photo-artist, like the painter, must embody the idea in his composition. It is not a question of focus, sharp or diffused.

Artists with the brush produce work of equal merit by extreme definition and extreme softness. Painters have their oil and water colors, tempera and pastel, ivory smoothness, and hot pressed paper, and so does the photographer have a wide selection in means and media.

The intent and purpose of both artists is to convey to the spectator of the picture the idea or motive the subject or scene has inspired, the infusion into

the work of his personality, and his ability to do this with the means for expression he has elected, and also by the observance more or less consciously of what are known as the rules and canons of art.

The necessity of the incorporation of the idea or motive in the picture precludes from the pictorial anything which presents itself merely for its attractiveness, its prettiness, and the recording of it by the general methods of automatic manipulation—that is, merely trying to get the “good” instead of the “true.”

The scene or subject must suggest some idea or thought or reveals to the artist some meaning or some especial beauty of light and shade. It may be something quite ordinary, not particularly attractive to the casual observer which does this, and generally is not to be extracted from a scene or subject the attractiveness of which is apparent at the first glance.

After the revelation, it is furthermore incumbent upon the artist to call to his service all his technical skill, all his resources for enhancing the effect, all that he has learned of the efficient handling of the means of mechanical control, just as the painter is obliged to do. We applaud the painter for his skill in manipulation of mechanical agency, and why should the photographer think it of minor consideration or derogate the proffered assistance, which the chemist or mechanic supplies for control in artistic production? Let us be a little more definite on the discussion of this infusion of the personality of the artist in his work, even at the risk of being prolix or profuse. We have to be a little on the defensive against the contentions of the many who relegate any artistic aspiration of the photographer, to the lowest stratum of art, and who call his efforts at anything approximating the ideal, “sheer presumption.”

We grant the limitations of photography, in the realms of the ideal, imaginative art. It would be folly to make the attempt, and we deplore the sensationalism of a few photo-transcendentalists.

The photographer's art is in his power of selection from nature what he feels is suggestive of expression of his mood or sentiment. He must choose these subjects which appeal most directly to his own taste and temperament, subjects which give him the sensation of pleasure from their appeal to his sense of the beautiful, embody his idea of conception. He will treat them in whatever manner and under whatever aspects he conceives shall best convey the impression they make upon his esthetic sense. If capable of doing this, then he may acclaim his effort a picture, for he shall have made something which calls up in some other person of artistic instinct a like feeling or emotion to his own.

In this way he will make something original, something interesting, and he need not struggle after novelty by sensational exploitation, unusual or unnatural exhibition, by suppression of detail or artificial diffusion of focus, for he can better demonstrate this novelty by conscientious observance of time-honored rules and principles of art.

If the photographer will approach his subject with a receptive mind, he will do more, and do it better than by trying to impose his conception upon nature, distorting and falsifying the actual by the crude devices of the mechanic.

The man of true artistic temperament always does go straight to nature, holds up the mirror to reflect her image in it, and does not hinder the mirror from performing the function as a mirror. He appreciates that these said canons of art are simply the general principles deduced by the close and analytical examination of the great minds who have built up art.

Of course, we do not mean to say that the mere observance of the rules and principles of art will make anyone an artist. Indeed it would have a contrary tendency, and a picture in which this show of absolute conformity is palpably manifest is most unpleasant. But by study of what genius has done, the man of perception will learn the broad principles of art, and get acquainted with the means by which great minds communicate their ideas and be enabled to select in nature what is in conformity with these principles, for, after all, they are the principles upon which nature works which give us delight in her manifestation of the beautiful.

LINE COPYING—C. B. NEBLETTE



THE copying of line subjects, such as for example structural drawings, printed matter, pen and ink or pencil sketches, etchings, etc., has always been such a simple matter for the writer, that he had thought it a subject offering no particular difficulties to the average commercial photographer, but from some prints which he has since received, from several sources, it seems that the matter is not so clear as had been supposed. The following notes are written from the practical experience of one who has done a considerable amount of work along this line, in the hope that they may be of value to workers who have difficulty in getting clear, clean-cut results with their line work.

Presuming that the photographer has, or can prepare, a suitable arrangement for evenly illuminating the subject and for keeping the plate and the subject perfectly parallel in all direction—conditions alike for all classes of copying—the first item requiring attention is the lens.

The best lens for critical line work is undoubtedly the process anastigmat. This lens, however, is seldom found outside of the establishments of photo-engravers and unless a commercial photographer has a considerable amount of line copying to do, it would be useless expense to purchase an objective of this type. A well corrected anastigmat, used at a moderate aperture, for example $f16$ to $f32$, is perfectly satisfactory for all but the most critical work demanding extreme precision. Personally all of my work has been done with an ordinary anastigmat, using on a 5×7 plate an objective designed to cover an 8×10 plate. Personally I consider the use of a lens covering a larger plate than that in use advisable whenever possible. The definition of all lenses, even the best corrected anastigmats, is much better in the center of the field than near the margin and by using a lens designed for a larger plate than the one in use we utilize only the center of the field where the definition of the objective is at its best. As regards anastigmats themselves, those designed to work at moderate apertures

of $f6.8$, $f7.7$ or $f8$ are superior to those of greater rapidity in which the corrections have been more or less "balanced" for a large effective aperture, so that at medium apertures the definition is inferior to that of the slower lenses.

Where a large number of workers go wrong is in attempting to use a rapid plate for this work. Even the slowest plates designed for commercial work are unsuitable and the use of a photo-mechanical or process plate is absolutely essential. Of course wet collodion is superior to either, but this is out of the question for the average worker. Such plates as Cramer Contrast, Seed Process, Central Process, Wellington Ortho-Process and the Wratten Process Panchromatic are especially made for this class of work and must be used in order to secure the extreme density and contrast required for subjects of this nature. The last two plates are color sensitive and a great help in dealing with subjects containing color. Since the introduction of desensitizing agents, panchromatic materials are handled with no more difficulty than ordinary sensitive materials and were I to do much of this work again, I would, in the interest of standardization, use nothing but panchromatic plates.

Focusing must be done with the greatest care. The use of a magnifier is advisable, as it allows more accurate determination of the correct point of focus. It is preferable to focus at the largest aperture and then stop down to the aperture decided upon for the exposure. Unless there is a danger of vibration, the use of a medium aperture is to be preferred. There is practically nothing to be gained from the use of a very small stop.

Exposure must be full, otherwise it is impossible to secure sufficient density. Although I have tried many systems of calculating exposure for copies, I have come to the conclusion that in the end the only reliable method is to make a trial exposure. Of course the calculations of light intensity, effective lens aperture, degree of reduction, etc., may be valuable for estimating the trial exposure, but subjects of this nature vary so much that I do not think any method of calculation is uniformly successful.

With originals of excellent contrast I have obtained excellent results using process plates with an ordinary metol-hydrochinone developer, but for the very best results and especially with weak originals, the following contrast developer is to be recommended:

| | | |
|------------------------------|----------|------------|
| Sodium sulphite (dry) | 75 grams | 2½ ounces |
| Metol | 1 gram | 15 grains |
| Hydrochinone | 9 grams | 135 grains |
| Potassium carbonate (dry) .. | 25 grams | 375 grains |
| Potassium bromide | 5 grams | 75 grains |
| Water to make | 1 liter | 32 ounces |

A very satisfactory solution, which is easily and quickly compounded, is secured by using hydrochinone in conjunction with formaline, as follows:

| | | |
|-----------------------------|--------------|-----------|
| Hydrochinone | 15 grams | 65 grains |
| Sodium sulphite (dry) | 100 grams | 1 ounce |
| Formaline | 20 c.c.s. | 1½ drams |
| Water to make | 1,000 c.c.s. | 10 ounces |

This developer is not so suitable for tank use as the former, but in other respects it is ideal.

This is one of the few cases in photography in which the author prefers development by inspection to the time and temperature or factorial methods. For one thing, a comparatively bright light may be used with safety, so that there is no difficulty in judging the appearance of the negative. As process plates fix back considerably, development must be carried just as far as possible without causing the delicate lines to veil over. A slight veiling, noticeable towards the close of development, may be disregarded, as it will disappear in the fixing bath. If development is carried as far as possible without affecting the clarity of the lines, the density will be all that could be desired, unless exposure has been insufficient. If exposure is insufficient the negative will lack density when removed from the fixing bath, even though the density appeared to be sufficient when development was concluded. On the other hand, if the lines begin to veil over in the early stages of development before the general density is sufficient over-exposure is indicated. In fact exposure to suit the original is practically the key to the whole problem, provided the proper plate and developer are used and development is carried to the limit.

Except with weak originals, intensification will be unnecessary. However, if a slight degree of intensification is thought advisable the well-known mercuric-iodide intensifier may be used after a preliminary washing following fixing. If considerable intensification is required, the lead, copper or silver-cyanide method of Monkhoven should be used. Of these I would personally prefer to use the copper intensifier because intensification with lead is accompanied with softening of the film, while Monkhoven's silver-cyanide method is extremely poisonous. Formulas for all three may be found in any standard textbook.

For the print, glossy papers are generally used, especially if there is an abundance of small detail. It may be noted that a hard, contrasty paper gives a cleaner-cut, black line than the normal or soft varieties.

It is easy to convert spoiled negatives into diagram slides. As soon as it is realized that the negative is a bad one, expose it to the full light so that it completely blackens. Then with a needle pushed in a penholder, work out the white lines.

To remove varnish from dry plate negatives, make up this solution: Caustic potash, one ounce; methylated spirit, 10 ounces; water, 10 ounces. Put the varnished negative in a tray, pour the solution on and gently rock until the varnish is dissolved. Then wash well under the tap.

I have found that a cracked glass negative can often be copied so that the crack does not show by running a little glycerine along the glass until the glycerine fills the crack. A sheet of glass is laid on the surface of the negative also with a little glycerine to cause it to unite optically and the negative can then be photographed with the crack almost, if not quite, invisible.

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A WORLD OF SUBJECTS

The longer photography remains before the public the greater becomes its scope—a truism, of course, but inevitable in the circumstances of the case. Truisms cannot be avoided. But not alone in extent of scope is photography advancing by leaps and bounds, but also in the constantly increasing number of subjects which the lens selects for treatment. Time was when the professional was severely restricted in his opportunities, portraiture, copying, enlarging, commercial work covered the list of his endeavors, but now he stops at nothing. He photographs anything or everything—he is a veritable Jack of all trades photographic.

When we come to the non-professional, the amateur pure and simple, the case is the same, only, if we may put it, more so. From the domestic interior and the garden, the man, woman, boy, or girl who carries a camera literally has the world to choose for subjects and, as may be seen from the photographs that are made, boldly takes advantage of the opportunities. Scarcely anything is sacred to the photographer nowadays, certainly nothing, or very little, is hidden from his lens.

At another time the snap shotter in public places was looked upon as a curiosity, then as a pest or a nuisance, now he is not only tolerated but welcomed. In fact, the world would be poorer in a great deal of usefulness and humor if the snap shotter ceased his efforts, and retired into oblivion.

It comes to this, that there is little in the daily life of the world, out of doors as well as indoors that is not worth an occasional shot. The commonest incident or scene,

everything in creation, in fact, invites the lens.

The writer is old enough to remember when the possibility of such a state of things in photography would have been scouted as absurd. Of course, quick acting emulsions, shutters and lenses are responsible for the marvelous development of what at one time, within recent recollections, was looked upon as a craze and likely to die out. To annex the colloquialism, not on your life.

The camera, therefore, duplicates the work of the eye and perpetuates the results. The amazing fecundity of the red herring is not more startling than the vast photographic fructification which constantly goes on, and will never cease.

One is bewildered as well as pleased at the plethora of results, which interest those who take and those who contemplate. Neither Lytton in "The Coming Race" nor Edward Bellamy in "Looking Backward" predicted such a condition of affairs and none of the modern futurist writers refer to it. And yet it is of vast importance for it influences the social life of every man, woman, and child in the community.

The mirror is held up to nature by the camera and one wonders how life would proceed if it ceased to function. There would be a void created which it would be difficult to fill, as everybody either photographs or is photographed. The camera is indispensable in life, it is a necessity, a part of our intellectual and mental food.

The photography of the world, however, singular to state, has only just begun. In times to come much that is overlooked or neglected will become food for the camera, and more and more on every available opportunity people will be found carrying cameras from "early morning till dewy eve." For as we point out at the head of this article, we have a world—literally a world—of subjects to choose from.

The other Sunday morning we were rambling round the quieter antiquated parts of this great city and regretted that our camera was not in our hands. We noted scores of picturesque bits for future treatment. The groupings one sees, too, by chance, make one regret one is not armed with a real detective camera, such a one as used to be placed behind the vest and operated by pressing a bulb in the hand. This type was extant long before the hand camera, as we now know it, came into use.

Amateur photographers are drawn from

all classes in a community. The age limit is indefinite, the irreducible minimum of effort is sufficient strength to release a shutter.

One does not often nowadays hear the pathetic question, What shall I photograph? It is all the other way, the facilities and temptations for taking photographs are so great that the superfluous, or rather the non-photographable are the things we first of all endeavor to note. The limitation is defined by the sun which when it ceases to shine stills our cameras for the time being.



THE VALUE OF CLOUDS IN THE PICTURE

In every landscape subject where the sky forms an initial part, or even only a part of minor consideration, attention to its effect must be considered, if pictorial expression is aimed for. The way in which the sky is presented makes or mars the picture.

Rocks, trees, streams and all the other elements of a scene may be looked upon as the personal features of the subject, its countenance, but the expression in this face is from above. The sky makes the scene smile, grow grave or seem angry, according as it associates itself, and hence it becomes the keynote of the sentiment intended in the pictorial utterance of the artist.

Painters know this and so they appreciate the value of the sky to the picture, but at the same time they appreciate the difficulty in getting those lovely forms of the clouds which the unerring sensitive plate so readily depicts. Yet how few photo-artists avail themselves of the ready means of registration.

In the majority of the beautiful presentations of sky prospect by the camera, we find that sky coupled with the sea, and the happy union is due to the fact that the intensity of the light of sea and sky is pretty near on equality, and so both, in the brief exposure possible, can be expressed in individual integrity. For, you know, the primal cause of failure in getting sky at the same time as landscape is due to the disproportion of the illumination, one being a direct light, the other reflected light.

A picture may owe all its success to the clouds in the sky, or it may be completely marred by the bungling way they have been artificially introduced. Art sense is essential for the association of clouds with land-

scape. A blank sky is preferable to a faulty introduction of cloud effect.

We might say a meteorological sense should be associated with art instinct, for despite the great advance in art quality in recent times, one occasionally does see heavy clouds over water so calm as not to exhibit a ripple on its surface.

There is necessity for true sky perspective in a picture and its agreement with the character of the landscape. Of course, this agreement is invariable when we secure the sky at the same time as the scene, but how rarely is this possible even with all our modern aids.

The yellow screen, even at its best, is so apt to destroy atmosphere, just what we want most to preserve. The screen is only useful for solid cloud masses, but useless for those delicate thread-like forms which "mock the eye with air."

A sky shade gives better results where the clouds are merely soft filament of spun vapor; or recourse may be had to printing in from a special appropriate cloud negative.



PHOTO-ART'S PROVINCE— REALISM

While photography played the part of Cinderella in art, the painters, with condescending generosity, were willing to let her pick a few grains of merit from the ashes, showing no jealousy while she acted in the capacity of a drudge to their noble calling; but, now that the golden slipper of approval has been found to fit, attempt is made to thrust her without the gates of the temple beautiful.

Artistic excellence in photography has even outstripped technique, so that much of the work of today is inclined to lean over to the side of idealism, if not to the dangerous verge of sensationalism. But photography as a means of pictorial production must essentially be realistic. Its power in art is in its truth to Nature combined with refinement in the selection.

"Who to the life an exact piece would make

Must not from other's work a copy make.
No, not from Rubens or Van Dyck,
Much less content himself to make it like
The ideas and images which lie
In his own fancy or his memory.
No, he before his sight must place
The natural and living face;
The real object must command
Each judgment of the eye and motion of
the hand."

If the painter may derive a lesson from these lines of Cowley, should not the photo-artist take courage, whose province in art is—

"the counterfeit presentment of Nature," whose aim is

"to learn her manner and with rapture taste her style"?

Art and Nature dare not be estranged. Art cannot be divorced from Nature and not suffer loss thereby.

It is contended by the idealist that art should not express any single thing, nor the whole mass of things as actually existent, but should present some general principle. But, what is really "an idealism" but a mental conception had by association of things intensely realistic, and the province of imaginative art is so to combine, associate and co-ordinate the actual, that a new creation results, an idea.

Why should photography be called a mere handicraft because her method indicates the truth?

"Truth is Beauty," as well as "Beauty is Truth."

It is futile to try to dress Nature to advantage and present unintelligible idealities and think them superior to Nature's divine beauty.

The pre-eminence of the great masters depends not on any fantastical excellency having no actual existence, a product of mental evolution, but in their vigor of selection from Nature what has excited artistic sensation. Taste is the outcome of the possession of this feeling, a sense of the beautiful, and its realization is the embodiment of some particular phase of Nature which has escaped the ken of those not endowed with the faculty of artistic perception. Certain forms in Nature embody certain characteristics, as of strength, activity, grace, repose, which appeal to the artistic emotion.

There is not a moment of any day in our lives that Nature is not constantly making picture after picture of exquisite beauty, but all do not see them. The mind must be attuned to their harmonies.

There are grand effects of light and shade, with delicacy of chiaroscuro, from the scarcely perceptible tone to the deepest shadow; transitions from strongest lights to densest obscurity, preserving the masses, but gradually softening the intermediate tones; every variety of beauty, all capable of translation by photography.

It is not to be asserted that there is nothing what we call ugly in Nature, for there

are isolations, antagonistic to beauty, but it is only because they are viewed as individuals. They are like the discords in music introduced to heighten the effect of the harmony.

It is urged by some that photography lacks art because it expresses structure too minutely, but detail expression, if combined with breadth of execution, adds rather than detracts from the enjoyment of the subject.

Photography as art has its limitations, and will never vie with painters' high art in embodying imaginative conceptions, the passions and emotions of humanity, but within her compass, which is gradually widening, she effects beautiful results which may be instrumental in calling present-day art away from inanities.

✱

At a meeting of the Scientific and Technical Group of the Royal Photographic Society, on March the fourth, a paper was read by Prof. Moritz von Rohr, on "Contributions to the History of the Photographic Objective in England and America between 1800 and 1875." No one is better qualified to speak on this subject than Prof. von Rohr, who is the author of what is without doubt the most complete and authoritative work in existence on the photographic objective—*Theorie und Geschichte des Photographischen Objective*. We have no doubt that the paper will be a valuable addition to the literature of the subject, the more so since there is a vacuum in English technical literature on the evolution of the objective.

While on the subject of the development of the photographic objective, we are led to remark how little real originality has been shown in the designing of photographic lenses and, on the other hand, how ingenious opticians have been in working over and modifying the designs of others. The cases in which a designer has completely left the beaten track and worked out an entirely new construction are rare. Of the numberless varieties of lenses on the market, virtually all of the better known can be classified under four or five well-known constructions. The four basic designs which cover practically all of the more important of present-day anastigmats are the Cooke triplet design of H. Dennis Taylor, the double-anastigmat, or Dagor, of Von Hoegh, the Tessar of Paul Rudolph and the Unofocal of Steinheil.

OUR PRINT CRITICISM DEPARTMENT

Prints to be criticised should be sent to the Criticism Department, THE CAMERA, Philadelphia. Only one unmounted print may be sent during any month by a reader. Full data must be sent on the coupon printed in our advertising pages. Always put title, name and address, and word "Criticism," on back of print.

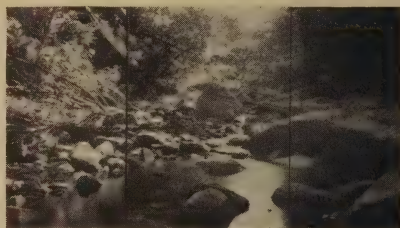
Painters, nowadays, and the present artistic school of pictorial photographers, instead of selecting landscapes representing miles of prospect, seek for effective subjects in isolated features of the scene spread out before their view—"little bits," as they are called, strips of marshes, confined meadowlands, interior of woods, a few sheep on the hillside, cattle in a brook, clumps of bushes, etc.

Individuality of treatment, sentiment, personal touch, or the embodied motive is better brought out than could possibly be effected in grand canvases of mountain peaks or illimitable prospects.

There is a danger, anyhow, of crowding too much in a picture. The fewer the elements making up the composition, the easier to arrange them to a unification of idea. Composition literally means "the putting together" and often the things to compose are refractory and become obtrusive. The ease with which the lens reproduces is a temptation to the photographer. If he had to draw things in, like the painter, he would hesitate.

We do not assert, by any means, that a wide extent of prospect is not pictorial, but we do advise that preference should be for the bits, and if for no other reason, this, because the presentation had by the lens is quite different from what the painter gives us. The lens is true in its perspective, while the painter sophisticates to the benefit of the subject. The actual perspective dwarfs the distance, and makes the far-off mountains come out like mole hills, while the painter exaggerates them and presents them in accordance with our mental perception,

as they seem to look to his artistic eye. Take, for instance, the picture by K. D. Swan, "September in the Hills." To the vision of the photographer this view must have been a grand one, but note how the photograph dwarfs the distance. In fact, the river, instead of suggesting miles of flow, seems choked up by the close-up mountains, and the far-off peak seems plastered against the sky, no suggestion of atmosphere, no recession of planes. The composition itself as presented is good. It needs a little more foreground, but there is good balance of the parts, but his artistic efforts would have resulted better had he chosen to expend them upon the pleasing little bit he could have abstracted by con-



"A Berkshire Brook"

centrating on the pines and rocks at the lower left corner. We lose the graceful peak, but we think the view gets more depth and the river more dignity. The motive is better suggested. All the view needs to make it a pleasing pictorial subject is more foreground.

"A Berkshire Brook," by John H. Kempf, demonstrates what we said about the advantage of concentration. This picture, as a whole, has little pictorial interest, because there is included too much irrelevant to the main topic, the brook. The eye is carried away from what should be the attractive feature. By simply evicting the obtrusive parts, which spoil the effect, and thereby focusing attention upon what is pleasing, we get a pictorial bit of much merit. Made in Pittsfield, Mass., with a 3A autographic Kodak fitted with a Kodak anastigmat. The exposure, in bright light at 2 p. m. in August, was 18 seconds at stop f16. The film was developed in pyro and the print made on Azo No. 3.



"September in the Hills"



Coatzacoalcos River, Mexico

Coatzacoalcos River (Mexico), by Lic A. Valenzuela. Here is a picture which takes in quite an extent of view, and we have to say it could not possibly be more pictorially rendered than it is. It is a charming view of fine composition and excellent in technical quality. The suggestion of distance and atmosphere is fine, and the sky prospect is delicate and in aerial perspective. Made at Minatitlan, Mexico, with a 3A Kodak special. The exposure, in cloudy light at 3 P. M. in May, was 1/25 second at $f6.3$. The film was developed in Elon-hydrochinone and the print is on Azo No. 4.

"Live Oaks," by Fred B. Sweet, presents opportunity to show how interesting an isolated bit of extended scenery may be made. The artist concentrated upon the grand oaks, and made the surroundings only accessory to them, and how well he has succeeded in putting a sentiment in the picture, instead of losing it in a multitude of detail by making the oaks a mere feature with the other elements. The composition is well handled and proper emphasis given to what is essential. Decorative effect is had by the graceful lines and masses of the trees, and the contrast of light and shade is very effective. "Live Oaks" was made in Southern California, with a Premo No. 10 fitted with an $f6.3$ Kollmorgen anastigmat



"Live Oaks"

and Ilex shutter. The exposure, at 2.30 P. M., in bright light in June, was 1 second at stop $f11$. The filmpack was developed in M-Q and printed on Azo No. 3.



"The Gorge, Oregon"

"The Gorge, Oregon," by A. H. Warmington. We feel sure this view presented a grand prospect to the eye of the photographer, but how uninteresting and untrue to the original is the photograph. It is not a subject lending itself to the camera. Unfortunately it does not, as here presented, give opportunity for abstracting a part which might be pictorially treated. Perhaps a closer-up view of the gap might give something. Made in Oregon, with a 3A Special Kodak fitted with a Cooke $f6.3$ lens. The exposure, in bright light at 10 A. M. in June, was one second at stop $f11$. The film was developed in metol-hydrochinone.

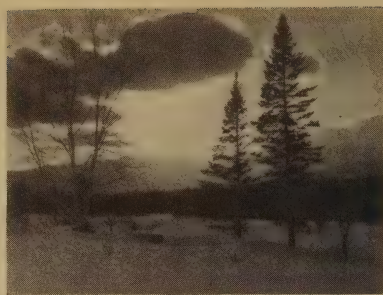
"Grazing," by Maurice Smith, is an isolated portion of a scene, but it lacks unity of idea. The parts are scattered and no attempt is made to bring them into harmonious relationship. There is opportunity to do so by using the cattle as a focus of interest; but unfortunately the two cows add to the dissipation of the subject instead of tending to its unification. Had they been grouped to the right and a little lower down, the eye would have centered on them, and the landscape, which is quite pleasing in itself, would have come into relation with them. The cows should have been made the principal feature, and then the landscape would have taken care of itself, and we would have had a pleasing bit. Made at



"Grazing"

Cold Springs, N. Y., with a No. 1 autographic Kodak fitted with an $f7.7$ anastigmat. The exposure, in bright light in July at 10 A. M., was $1/25$ th second at $f11$. The negative was made on Eastman film and the print is on Azo No. 4.

W. H. Pote, in "The Day is Near Done," just misses giving us a very fine composition with the motive brought out—the sky is too heavy, making the composition out of balance; the great cloud mass is even of greater intensity than the hill. What is wanted here is a delicate sky so as to suggest atmosphere and distance. There is not sufficient separation of the different planes of the picture. Decorative effect contributed by the trees is excellent. Made at Lincoln, N. H., with an R. B. Graflex fitted with a

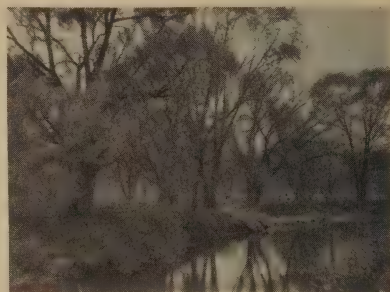


"The Day is Near Done"

Carl Zeiss Tessar. The exposure, in bright light at 4.30 P. M. in February, was $1/10$ second at $f8$. The film was developed in metol-hydrochinone and printed on Azo No. 2.

"A November Morning," by Louis Hozvitska. The composition is pleasing, although made up of simple elements. Monotony is avoided by the slight emphasis above the other planes in the immediate foreground with the reflection in the water. This slight intensification of this part serves to give some relief. The blur in the foliage adds to the pictorial effect by suggesting atmospheric movement, agitation of the wind; definiteness of detail of the foliage would have taken much from the sentimental value. "A November Morning" was made in New York with an 8×10 view camera. The exposure, in dull light at 9.30 A. M. in November, was two seconds at $f7.7$. The Cramer medium Isochromatic plate was developed in metol and the print is on Artura.

"A Rainy Evening," by Calvin R. Limprecht, is a good picture of its kind, but work of this kind has been exhibited so frequently and by such masters of the performance that we are inclined to demand particular features to give more novelty to the subject. The walking figures, however, come in here for praise. Their action is very good; they are actually progressing.



"A November Morning"

The artist has caught them just at the right instant to express movement, and so they do not look as if petrified, as is too often the case, and, furthermore, he has represented the street obliquely, so that our vision is carried into what is behind the figures at the same time that it sees the space in front. The reflection is also good. It gives the needed shadow in the foreground. Made in Durango, Colorado, with an Ansco V. P. Speedex fitted with a Bausch & Lomb Tessar. The exposure, in dull light at 6.50 p. m. in July, was $1/25$ th second at $f4.5$. The Ansco film was developed in metol-hydrochinone and the print is on Artura Carbon Black.



"A Rainy Evening"

"Childhood Days," by W. F. Harris. Here we have a nice bit of the landscape selected to introduce figures and the artist has placed the figures effectively. They are naturally portrayed, and in good action, interested in their own childish business. The surroundings are in good relation with the boys; a good setting. The little glimpse of the brook is effective, and gives variety to the scene. The only suggestion, by way of improvement, would be in the removal of the high-light on log to the right. Made in Albany, N. Y., with a 5×7 Century Grand, fitted with a Goerz $f6.8$ Dagor lens. The exposure at 2 p. m. in bright September light, was $1/10$ th second at $f8$. The Standard Ortho plate was developed with pyro in a tank and the print made on Novagas No. 10, soft.



"Childhood Days"

"Disappointed" is a portrait study by Mary Hall. The pose of the head is good and the face is at an angle to get the line of the nose in proper relation with contour of the face, this is too often overlooked, even in otherwise good portraiture. The direction of the illumination was all right, but the light itself was not pure enough, too much depressed, with the result that the high-lights are smudgy and the shadows dull. The head has good relief and stands out atmospherically from the background. The principal fault is the smudgy light. Made in Texas with a 3A Seneca fitted with a rapid symmetrical lens. The exposure, in bright light in August at 3.30 p. m., was one second at $f8$. A portrait attachment was capped over the lens and a combination back taking cut film holder was used. The Eastman super-speed film was developed in Eastman special powders and the print is on Azo No. 2.



"Disappointed"



"Buried Treasure"

"Buried Treasure," by F. S. Scheetz. Here is a group of children with domestic accessory surroundings, instead of nature. The surroundings are quite in harmony with the group, and help to explain the motive; action is also good; the little fellows are in it for all it is worth. The photograph is good in technical quality. Made in New Jersey with a Rexo special fitted with a Wollensak anastigmat. The exposure was $1/25$ th second at $f6.3$, in bright light at 1 p. m. in September. The film was developed in Rytol and printed on Azo No. 2.

"Pennsylvania Station, New York," by Robert A. Kimotten, is interesting, but a little flat in the illumination. There are not enough depth and relief. The best feature is where the light comes in. This is nicely managed, just as it would be shown in a fine engraving of the subject. There is no halation, but a nice diffusion of the incoming light. Made with an Ica reflex fitted with an Orix anastigmat. The exposure, in bright light at 10.55 A. M. in January, was $1/15$ th second at $f4.5$. The negative was made on an Ilford Iso Zenith plate developed in Rodinal and the print is on Azo No. 4.



"Pennsylvania Station, New York"

"Peaches," by Sarah H. Moss. This might be called a study in black and white, in more sense than one. Photographically, it is a good presentation of tonal values. The range of tone from high to low is well managed, the high-lights are soft and pleasing and the modeling is good, the deep tones are rich and varied and there is also nice gradation of tone. The composition is also good; figures well posed and in good action—the little fellow in particular. The spacing is good and the accessories in keeping with the topic. Made near Athens, Georgia, with a 2A Brownie. The exposure was made shortly before noon in July on the north side of a house with a quick time-exposure. The film was developed and printed by a commercial finisher.



"Peaches"

Another group picture by S. Rabinowitz, entitled "Planning." This group, though not as pleasing as "Peaches," is quite well presented. There are four figures to manage and the photographer has disposed of them in two groups with a connecting motive, which, however, requires reference to the title for clearness. Individually each of these groups is good, but they are too far apart. The technical quality is good, too, and the accessory background in keeping with the subject. "Planning" was made in Brooklyn, N. Y., with a 3A Kodak special fitted with a Tessar lens. The exposure, in bright light at 4 p. m. in June, was $1/25$ th second at $f11$. The Seed 26 plate was developed with pyro and the print is on Azo No. 3.



"Planning"

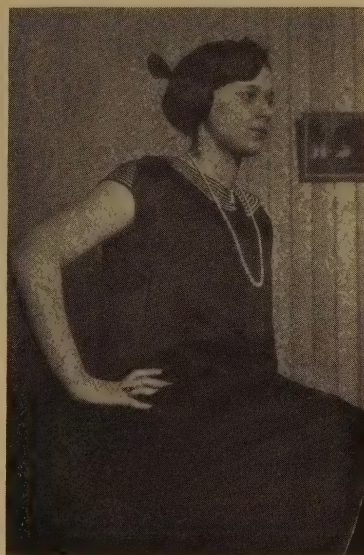
"The Portrait," by L. Archambault, does not have the head as gracefully posed as Miss Hall's portrait, but his light is purer, and so he gets better values in flesh and drapery. The direction of the light, however, should have been managed so as to get the high-light spots on the pupils which gives vitality to the portrait. Made in Montreal, Canada, with a Speed Graphic fitted with a Ross Homocentric. The exposure, in dull light at 2 p. m. in December, was $\frac{1}{2}$ second at $f4.5$. The Imperial Eclipse plate was developed in glycine and the print is on bromide.



"The Portrait"

Maurice Smith's portrait, "Miss Gladycce," has a number of faults. The illumination is flat, so there is no modeling in the face. The pose is angular and constrained, which shows its effect in the expression of the model. Note the unpleasant bend of the arm, and the pose of the body, completely amputating the other arm. Note how the

figure is plastered to the background and the picture on the wall is dangerously near the head. Made in Brooklyn, N. Y., with a Goerz Taro-Tenax fitted with a Syntor anastigmat. The exposure was made by flashlight at $f9$. The Eastman super-speed cut film was developed in Elon-hydrochinone and the print is on Azo No. 2.



"Miss Gladycce"

"Sunday Morning," by Alfred Elting, may be much improved by trimming out parts of no interest to the subject. In other words, it lacks concentration. By the trimming, it will be seen that the great mass of blank darkness in the foreground is eliminated. It will be noticed also that the perspective is improved thereby. "Sunday Morning" was made at New Paltz, N. Y., with a Korona view camera fitted with a Wollensak Velostigmat. The exposure, in bright light at 9 a. m. in September, was $\frac{1}{5}$ th second at stop $f32$. The negative was made on cut film, which was developed in pyro and printed on Azo No. 2.



"Sunday Morning"



"Look, Dolly!"

"Look, Dolly," by G. E. Brower, may be considered a genre picture. It is a good piece of portrait composition, well spaced and figures nicely posed to carry out the motive. The little girl is full of grace, naturalness and animation. Her expression shows interest, the doll looks interested, too. The illumination is soft and pleasing, and has the charm of novelty. Value well preserved and good atmosphere throughout. Made with a Compact Graflex fitted with a Bausch & Lomb Tessar. The exposure, in bright light at 10 A. M. in March, was $1/5$ th second at $f4.5$. The filmpack was developed with pyro in a tank and the print is on Artura Iris.



"Book Plate"

Carl Ahlers contributes a book plate design which is got up in a pleasing decorative way, and serves its purpose well. It is a view of Chehalis River. As a composition, the subject is presented in too great contrast, merely black and white. The foliage has no gradation of light or shade and distance is not suggested at all. Made at Raymond, Washington, with a Korona view camera fitted with a Deltar lens. The exposure at 4 P. M. in July was $1/5$ th second at $f7.7$. The Red Seal Hammer plate was developed in Pictol-hydrochinone and printed on Noko.

"A Southern California Trail," by Marshall L. Murray. This is a beautiful piece of work and of high technical excellence. It is pure photography, demonstrating that the result is far superior to anything doctored for effect. Besides it obeys all the rules of art composition, and delights by giving the truth. The various planes are preserved, and the linear and aerial perspective charming. The distance recedes from the eye. One can, by vision, travel right into the view. Management of light and shade in the masses effective. The various parts combine harmoniously to a



"Southern California Trail"

unity of idea; nice range of gradation throughout, from deepest shadow to highest light, and good modulation in both high-lights and shadows. The mounted figures are rightly placed and in fine action. The position of the mules is particularly good, and the decoration—that is, the pleasing direction of the lines and the shapes of the masses of light and shade—make a most pleasing pattern in themselves. The large figure in front is a little obtrusive and usurps too much attention. A dog, or even nothing here, might increase the beauty of this little gem. Here is a case, by the way, where the subject is better without clouds. Clouds, even delicate ones, might throw the picture out of balance. It has atmosphere enough in itself. Made near Sierra Madre, California, with an Ansco vest pocket camera, fitted with an Ansco anastigmat. The exposure, at 2 P. M. in July, in bright light, was 1/50th second at f/16. The negative was made on Eastman film and developed in Eastman special developing powders. Print on glossy Velox.



A MULTITUDE OF COUNSELORS

In reading the periodical literature of photography, as well as the books, the question arises in one's mind, Whom is one to follow? For instance, take the lens. Much is written and published on this indispensable instrument, but if you attempt to assimilate all of it you are apt to become bewildered. Still, it makes good reading about one of the indispensable photographic tools one must possess in order to make photographs.

If one were to take all the books and articles and classify the advice given by each author, what sort of result should we obtain? What is an "all-round" lens? At one time such an instrument as this was gravely recommended by authorities, self-constituted and otherwise. Nowadays people are more precise in their recommendations.

What applies to the lens applies also to everything else used in photography. The proverb says, When doctors differ, who shall decide? Well, the patient usually does that for himself. He either gets well, or dies.

Now, it is much about the same in making photographs. Some of the best photographers we have met were not in the habit of reading anything else but manufacturers' catalogues and formulas. We remember once getting a job in a photographic plant and when it leaked out that we had been connected with the literary side of the sub-

ject we were openly derided as a mere "theorist." Well, we admitted the soft impeachment, but very soon proved that we could produce good practical results and changed contempt into respect.

Nowadays, nearly everybody who writes about photography is required to supplement his teachings with photographs taken by himself. It is well that it is so, for we are enabled to profit by the blackboard examples of our teachers.

"Lord, how it mops up the gold!" said a man in our hearing in the old days of gelatino-chloride printing (P. O. P.). He was practical minded, and he became a successful seller of apparatus, through this habit of taking nothing for granted in the manipulations of his material. The formula said one thing, practice said another.

"An ounce of practice is worth a ton of theory." It cannot be too strongly urged upon the photographer that practice makes perfect. If you read you must also work. In fact, while "reading maketh a full man," practice makes one perfect in one's trade, calling, pursuit or profession. The thought devoted to a thing must be translated into action, otherwise one does not get results.

The beginning of wisdom is a desire for knowledge. Now knowledge is both theoretical as well as practical. You acquire the former from books and articles, the latter from practical work. So it is as well, while reading, to suit the action to the word and aim at results as soon as possible.

"Spell winder (window)," said Squeers of Nickleby, to one of his unhappy pupils.

The word was spelt, after a fashion.

"Now go and clean one," said Squeers. So he combined literary with practical instruction. He was practitioner as well as pedagogue.

The primer of our schooldays led us, step by step, along the paths of literary knowledge. We take delight—do we not?—in harking back to our first lessons in one syllable words, then we graduated to polysyllables, and finally we began to read and when we could read we began to understand the things around us, and then we began to take a practical interest in them.

The same rule applies to photography. We must first acquire the alphabet, then learn to read, and next to convert this theoretical knowledge into actual work. There is no exception to this rule and the closer we stick to it the more successful we are likely to become.

The records of photography amply attest the truth of all this.

QUESTIONS and ANSWERS

All questions relating to technical matters, processes, working instruction, etc., are referred to competent experts in the particular subject referred to, and the utmost is done to insure reliable and practical answer being given.

Correspondents are requested to first state their case, and then number each question. They should also write on one side of the paper only, and enclose correct name and address—not necessarily for publication. No attention will be paid to anonymous communications nor to those only signed with initials.

We do our best in all cases to publish the replies in our next issue following the receipt of the inquiry, but cannot absolutely guarantee this.

I do not like to use the regular fixing bath with acetic acid as I am very sensitive to its fumes and a tiny amount annoys me. Can you give me directions for a fixing and a hardening bath—one which will keep well?—N. H. T.

Use the chrome alum hardening bath with potassium metabisulphite. Here is a formula we came across recently:

| | |
|--|--------|
| Hypo | 8 oz. |
| Potassium metabisulphite, 1 part to 5 of water..... | 3 oz. |
| Chrome alum, 10% solution..... | 4 oz. |
| Water | 16 oz. |

Criticism is often made of this bath that it does not keep well, that it gets dirty and precipitates. This can be obviated if the chrome alum is added just before using. Keep the bath in two solutions, and give ample time for fixing that hardening may be complete. This can be told by the leathery feeling of gelatine surface as the hardening proceeds.

Why do formula writers sometimes specify mix in order given? I always do this when indicated but I am curious as to the reason why.—C. H. K.

Sometimes the addition of one chemical to another makes a precipitate, which would not form if other ingredients were already present. In other cases, the solubility is much greater when a third chemical is present. We have in the first case precipitates of sulphur in hypo baths; these do not form when the right order of solution is followed. In the second case, we have cases like the water solution of mercury chloride in making up an intensifier. Even with warm water, the rate of solution is slow. When sodium or ammonium chloride is also present, the rate is much accelerated. In other cases, like metol, warm water is

not desirable, and likewise on metabisulphites. In other developers, we dissolve sulphites first as the developing agent is sometimes sparingly soluble in water, but more freely so in sodium sulphite solution. It is well to assume that the order of the formula should be followed, even if no specific directions are mentioned.

Please tell me how to figure the exposure for single combinations of lenses like Dagors or Dogmars, where single lenses also can be used.—H. B. F.

The same general remarks apply to all lenses of this type, including Wollensak, Voigtlander, Protars, etc. In the Dagor, the single combinations give approximately double size images. The stop diameter remaining the same, $f8$ becomes $f16$. The stop value being halved, the exposure is 2×2 or 4 times normal. With front Dogmar combination a similar relation holds. With the back lens, being $1\frac{1}{2}$ times normal focus, each stop now takes $1\frac{1}{2} \times 1\frac{1}{2}$ or $2\frac{1}{4}$ times as much exposure. In case of Protar VIIa or Ross Combinables (if the proper adjustment of diaphragm scale ring is made), there is no change in exposure. The markings automatically show the actual f value corresponding to the diameter of the diaphragm. In this case, all exposures are the same (stop for stop), but of course stops like $f11.3$, or higher, are not shown when single lenses are used.

Zeiss, however, in place of f values, puts on the diaphragm ring a series of markings showing actual millimetre diameters of stops. It is claimed that this method, by use of the necessary tables, is a more convenient one. There is no difficulty if tables are not mislaid, but on the other hand, one can forget to turn an adjustable collar or can set it for the wrong focal length.

How can one stick a label on a dark room bottle so it won't come off?—L. A. D.

Use the principle of the carbon process. Make a thick gum and add to it a few drops of saturated solution of potassium bichromate. Use just enough for an orange color. The label should be exposed to strong light, which makes it insoluble or partly so. The label in place can then be overcoated with celluloid varnish, so it runs over on to the bottle. You can expose such labels to damp for years. Water running down over them will do no harm. You can make a very satisfactory label by using a colored glass marking pencil such as is sold for pricing china and glassware. A similar pencil is sold for marking on blank lantern slide glasses for announcement purposes.

Are cut films double coated so that they will stay flat?—G. O. P.

They are double coated, but not in the same way that non-halation plates are treated. These have two sensitive coatings, one of which overlays the other. The film has a coat of gelatine on the back to counteract the curling effect of the emulsion coating. Films automatically reduce halation since they have no reflecting surfaces like glass plates to throw back halation, fog or halo images around very bright lights. Obviously the back, as well as the front, should be kept from touching anything while drying. We have seen bad stains on backs of films due to faulty developing solutions or old fixing baths. Such stains will sometimes respond to permanganate clearing solutions.

Can a telephoto lens be obtained with super-magnification? What is the ordinary limit of magnifications?—K. J. D.

We presume you refer to a telephoto attachment in this connection. These run up to 8 powers generally. On some types, 9 powers and 12 powers are attainable. Taking a 7-inch lens as a standard, the image size produced by the above maximum magnifications are respectively those corresponding to 56, 63 and 96-inch lenses. There was stated to have been used in the Boer War, telephotos of super power. Their practical use is doubtful. Difficulties from vibration increase enormously with high powers corresponding to great focal lengths. The Staley-Wheeler telephoto was an attempt to introduce convertibility into telephoto work. Here was supplied three negative elements, to be used singly, or in pairs, or as a triplet, all working with the same positive photo lens. There are seven possible arrangements, and the triplet combination gave the shortest negative focus and consequently the highest magnification. This was 31 powers. The difficulty of focusing is very great, as we know by personal experience, trying to get

a clear image of a distant lighthouse. Outside of the vibration troubles alone, heat currents in the intervening atmosphere, lack of contrast which of course demands filters, hoods to cut off the stray light, other reflections in telephoto mountings, etc., all add to difficulties. Telephotography in warfare with high powers is still further complicated by vibrations through the ground and even in the air. An interesting variation of the telephoto principles is the Super-Telescope, by which a fly or an insect which would move away if approached too near by the camera, can be photographed on an enlarged scale. On the Mt. Everest expedition of 1922, a specially designed telephoto lens giving 100 magnifications was said to have been used to give photographs of climbers way up on the snow fields.

My lens does not give a sharp image all over its field. One of my friends says the lens is no good, another says it is out of adjustment. He says if wrongly made, it would not be sharp in the center when the corners are sharp, or vice versa, and he also says my ground-glass may be out of register. I have a compact cycle plate camera, old model. How can I test the lens? It is an old rapid rectilinear.—D. P. Y.

If the maker can be reached, better send it to him with your comments. If not, you can test out by successive steps as below. We will assume the plate holders are in register for the time being. Focus on the ground-glass, using a flat object with sharp lines. Focus in the center, then note if the corners are then sharp. If not, then focus on the corners, which should now come equally sharp. The difference in extension of camera is a measure of the curvature of the field. Should a corner be sharp, and also the corner diagonally opposite also be sharp, the other two corners being unsharp, you may have some decentration. To test this, unscrew the lens a quarter-turn in its flange, refocusing if necessary and if now the sharp and the fuzzy corners interchange, this indicates a decentration. Such might be due to the cement having softened so that the combinations have slipped out of optical alignment. It might have come from dropping the lens. It might never have been centered. Of course, it is assumed that the lens board face is always parallel to the image. If a swing back is on the camera, see that in testing the camera that it is parallel to the lens board, that is, perpendicular to the axis of lens. There might be a twist side-wise as well, and with a lens which is all right, you might nevertheless have one side out of focus and other side in focus. If you will focus on a light in the center of the ground-glass and revolve the lens, the

light should stay stationary, but if it describes a circle, you have decentration indications. In a view type of camera, the ground-glass surface faces inwards, but on a cycle type, the ground-side face is sometimes outward by design. The scale is probably set properly; make sure that the focus for the short distances, measured accurately from the lens, is right on the scale mark. Reverse the ground-glass and see if this (completely) corrects matters. The ground side of the glass always lies on the rabbets. Should a photographic test then not verify this visual inspection, the plate holder register with ground-glass should then be investigated. Most rapid rectilinears were very good when cemented properly in optical alignment and the chances are that when properly recemented your lens will be as good as new. You must, however, put up with some curvature of field; a defect of rapid rectilinears which the anastigmat lenses are free from.

What does dampness do to sensitized products which have been exposed with an image?—I. L. O.

The image may deteriorate and do so unevenly. Do not make prints or bromides and keep them long before developing. Bromides should not be kept overnight before developing, especially when it is very damp. We personally saw some quantity production prints made by a printer who had run off a lot of exposures as a matter of convenience and thought he would run them through in a big batch in the developer. The prints, on double weight paper, had rolled up and the moisture therefore could easily get into the center. The result was that every print developed with a dark bar across one end, but fortunately, with full development, they finally came through all right. They do not always do so. Films should not be retained long before developing and in general, all sensitized products may show some fading of image or possible mottling.

What is the speed of an f4.5 lens for a 5x7 when used on a 4x5 plate? Would you buy an oversize lens as recommended on some cameras?—D. O. T.

You have some confusion in your understanding of what lens speed really means. At f4.5 you have the highest possible intensity of your lens, but at smaller stops, like f8 you have only the intensity of an f8 lens at its full opening or of any lens stopped down to f8. The covering power is greater with the longer focal lengths, but, of course, when a 4x5 area only out of 5x7 covering power is used, all rays outside the 4x5 area are inert except that they reflect from the bellows and sometimes cause some fog. Oversize lenses are put on some reflecting cameras because of mir-

ror interference which would result if shorter focus lenses were used. Thus 9½-inch lenses are used on long bellows 4x5 cameras, whereas 6-inch lenses are satisfactory on the regular models. There is sometimes a possibility of using shorter focus lenses than the manufacturers recommend. On a speed camera, extra long focus lenses are many times awkward to use; perspective teachings are all right, but one has to get the whole subject on the plate, and, of course, the shorter focus f4.5 lenses are in practice faster than the longer focus ones because they can be used at the larger apertures more frequently.

I have a lens of foreign make marked f6.3, 6.8, 9, 12.5, 18, 25 and 36. Can you give me the values in the f system as I cannot use the numbers with my exposure book?—H. S.


There is no reason for cameras for the American market being marked in odd systems. There is no way to translate it, as it is one of the innumerable ratio systems—an *f* system used in Europe, but not the accepted *f* system, common to cameras made here. Its f6.3 is the same f6.3 as our ordinary *f* values. If you set down the numbers in order as below, we can then put a series of exposure values beneath, omitting f6.8 value.

| | | | | | |
|-----|---|------|----|----|----|
| 6.3 | 9 | 12.5 | 18 | 25 | 36 |
| 1 | 2 | 4 | 8 | 16 | 32 |

Whatever you give for f6.3, as for instance, 1/100th second, for 9 give 2/100th or 1/50th second, for 25, give 16/100th or 1/6th second. 1/5th the second would naturally be used here. For f6.8, we take 6.8 squared or 46.24 and f9 squared or 81, and by simple proportion, we find the exposure value for f6.8 to be 1.14. The logical thing to do would be to have the scale re-engraved with standard *f* numbers, f6.3, f8, f11.3, f16, f22.6, f32, etc. Any exposure table or chart could then be used directly and you could take advantage of exposure information published in this magazine or others.

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The well-known Parisian illustrated photographic monthly, *Paris-Photo*, will in the future be published under the title *Photographie pour Tous* (Photography for All) by the Establishments Photo-Plait, 37 Rue Lafayette, Paris. The journal will remain under the able editorship of G. Pascaud and will no doubt maintain the high standard of its predecessor and continue to appeal to the wide range of workers with whom the *Paris-Photo* was deservedly popular. The subscription price for foreign countries is 30 francs.



VIEWS AND REVIEWS



Prof. Eduard Valenta, noted for his work in photochemistry and spectroscopy, has succeeded Dr. J. M. Eder as Director of the School of Graphic Arts at Vienna. Dr. Eder resigned the directorship of the institution about a year ago.

✽

The Williamson Photographic Research Award of the Royal Photographic Society has been awarded to Mr. K. C. D. Hickman for the second part of his paper on "The Washing of Photographic Products—An Electrical Device for Measuring Minute Amounts of Hypo." The paper was published in full in the *Photographic Journal* for May, 1923.

✽

The fourth Hurter and Driffield Memorial Lecture of the Royal Photographic Society will be delivered either in the latter part of this month or the first of May, by Dr. C. E. K. Mees, Director of the Eastman Research Laboratory. Dr. Mees has personally done a considerable amount of valuable work on sensitometry and we can imagine no one better fitted to deliver this memorial lecture to pioneers of sensitometric investigation.

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In our advertising pages will be found the announcement of a competition by the Wollensak Optical Company which is open to all amateurs using Wollensak lenses. There will be three classes, speed, pictorial and general and four prizes in each class. The first prize is \$20.00 in cash, the second \$10.00 in cash, while the winner of the third prize will receive a \$5.00 Biascope and the winner of the fourth prize a \$2.00 Pockescope. Besides the twelve major prizes, there will be twenty "honorable mentions" who will receive a Pockescope, Jr. All negatives submitted must have been made before February 15, 1924, and the prints should be accompanied by full data. The closing date is May 1, 1924. Users of Wollensak lenses will do well to go over their stock of negatives and enter prints of some of the most promising in this competition.

Dr. Alexander Gleichen, well known as the author of a work on the theory of optical instruments, died on October 21, 1923, at Berlin, aged 61 years. He was professor of Optics at the Superior Technical School at Charlottenburg from 1904-1908. He had also served as an examiner of the Patent Office and as a director of the ophthalmometric section of the C. P. Goerz Optical Works. The English edition of his "Theory of Modern Optical Instruments," translated by McElwain and Swain, contains the most complete data on the construction of modern photographic lenses of any work in English.

✽

It is much to be regretted that stereoscopic photography has been gradually losing ground for the past few years to such an extent that, excepting for the small 45 x 107 millimeter cameras of the Jules Richard Verascope type, stereoscopic work is practically extinct. We are therefore interested in the announcement of a comprehensive work on the subject by a French writer, E. Colardeau, under the title of "*Traite General de Stereoscopie*." There has been a dearth of works on the subject for the past few years, hence we welcome the addition of a complete textbook on the subject and look forward to reporting on the same for the benefit of our readers.

✽

In the January number of the Swiss periodical, "Camera," Dr. J. M. Eder has a note on the evolution of the methods of toning by mordanting. It is interesting to find that Dr. Eder credits a Philadelphia photochemist, Mr. Carey Lea, as one of the first, if not the first, workers in this line. He published in the *British Journal of Photography* for March 31, 1865, a method which consisted in treating a silver image which had been bleached in mercuric chloride ammoniacal carmine to obtain a purple tone. In view of the widespread application of mordant toning methods for cinema film and various color processes, information on its introduction is not without interest.

At a meeting of the Societe Française de Photographie, M. Godefroy exhibited a panoramic print on albumen paper which was made in 1868, and exposed to the light continuously until 1914. The print was made on Rives paper, sensitized by floating on a bath of silver nitrate and was toned with gold chloride and acetate of soda. After having been almost continually exposed to light for 47 years, comparatively little alteration had taken place. This is surely an endurance record for a silver print and shows that when properly made the permanency of silver prints will compare favorably with platinum or the pigment processes.

✱

To those societies and clubs who are considering a Salon or Exhibition open to all pictorialists, we would suggest that they formulate definite plans a considerable time ahead of the intended exhibition, in order that prominent pictorialists may so arrange their schedule as to accommodate the various salons which they are asked to support. As it is now, the announcement in many cases antedates the exhibition only by a month or so and intending exhibitors are often unable to contribute, owing to the fact that their prints have already been sent elsewhere. If those in charge of such matters will bear this in mind when arranging the details of their shows we have but little doubt that they will receive better support from prominent pictorialists.

✱

Great things have small beginnings. In a recent lecture before the Royal Photographic Society of Great Britain on the occasion of the inauguration of the Kinematograph group, Dr. W. Day reviewed in a very interesting manner the evolution of the cinema from the early work of Rudge of Bath, Beal's Choreutoscope, Linnel's Kineograph, Heyl's Phasmatrope, and the work of Marey in Paris and Muybridge in San Francisco. Judging by the report of the lecture in the *Journal*, which may or may not be complete, but scant attention is paid to the work of Lumière, Pathé and Gaumont in France and Edison in America, the lecture dealing for the most part with the antecedents of the cinema. Perhaps Dr. Day will find sufficient leisure to complete the subject with another lecture on the development of the cinema itself, following the introduction of the flexible film.

For the first time, we believe, since the first year of the world war, the Photo-Club de Paris will hold its annual Salon this year from October 3 to 14, inclusive. The Photo-Club de Paris and the Societe Française de Photographie have joined hands for promoting the Salon, which will be held at the house of the latter, 51 Rue des Clichy, Paris. Entries will be limited to six prints and should be mounted on flexible mounts not exceeding sixteen inches in the longest dimension. A fee of ten francs will be charged to cover cost of packing and return. Further particulars may be obtained from E. Cousin, Secretary of the Societe Française de Photographie, 51 Rue des Clichy, Paris. The Salon of the Photo-Club de Paris has long been one of the leading photographic salons on the continent and we hope that American pictorialists will see their way to support the same generously.

✱

The establishment of the Kinematograph group by the Royal Photographic Society is another evidence of the wide-awake attitude of the officials and members of the oldest and leading photographic society in the world. There has been a notable development in the activities of the Royal in the last five years, beginning with the establishment of the Scientific and Technical group in 1919. This was almost immediately followed by the Pictorial group, devoted to the needs of the pictorial worker, and now we have the Kinematograph group for the benefit and advancement of that growing industry. Just how much this new venture of the Royal will accomplish remains to be seen. Much will depend upon the support which it receives from those connected with the industry and we take this opportunity of calling the attention of those who are able to be of assistance to the advisability of aiding in the development of the group from its beginning, in order that it may be of real value.

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The recent *Daily Mail* Ideal Home Exhibition, an annual London exposition, held under the auspices of the London *Daily Mail*, was the first in which photography has found a place. From the pages of *The Photographic Dealer* we learn that among the prominent photographic exhibits were those by Houghton's, Ltd., W. Butcher & Sons, Ltd., and J. H. Dallmeyer, Ltd. The first of these firms had on view a two guinea reflex, making $2\frac{1}{4} \times 3\frac{3}{4}$ pictures on

roll film. Butcher & Sons, Ltd., exhibited their new "Sporty-Carbine," a vest-pocket camera of novel design, which retails at 8 shillings 6 pence. The exhibit of J. H. Dallmeyer, Ltd., the well-known lens firm, consisted of a huge reproduction of their "Speed" camera. This giant model was about ten feet high and an exact reproduction of the small camera to scale. Inside of the giant model was a cinema projector, which projected onto the lens of the camera a film showing the manufacture of lenses in the factory of Messrs. Dallmeyer.

✽

Mr. Bertram C. Wickison described in a lecture, before the Royal Photographic Society last December, the methods used by him in making the combination prints which figured in the Annual Exhibitions of the Society for many years. As an example of what can be done by an intelligent application of combination printing, a reproduction of one of his completed exhibition prints "The Farm on the Marsh," together with the three negatives from which it was made, accompanies the report of the lecture in the March issue of the *Photographic Journal*. It is quite surprising what an excellent and wholly satisfying picture has been made from three quite ordinary negatives having no particular pictorial merit of their own.

Combination printing may be said to have fallen into the discard following the days of H. P. Robinson and Horsely Hinton, and, with the exception of J. M. Whitehead, we know of but few prominent workers who have consistently used it. It undoubtedly demands a thorough sense of fitness and artistic proportion, but we see no reason for the wholesale condemnation of combination printing because of the fact that many workers fail to possess the sense of proportion necessary to the proper use of the method. Mr. Wickison's print illustrates, we think, what may be accomplished legitimately by combination printing when in competent hands.

✽

From a note in the *B. J.* we observe that progress is being made by the staff of the London *Times* in the photography of stage performances by ordinary stage lighting; a matter referred to in these notes in our February issue. A series of prints reproduced in the *Times*, which were taken under the ordinary lighting conditions during the performance of "Der Meistersingers" by the National Opera at Covent Garden, show considerable improvement over

similar results obtained a few weeks ago. They were made with exposures of 1/10th of a second, using a new lens developed by Taylor, Taylor and Hobson, having a relative aperture of $f2$. Using Ilford panchromatic plates, it has been found possible, under certain conditions of illumination, to make exposures as short as 1/25th and even 1/50th of a second with the above lens. An exclusive license has been granted to the staff of the *Times* for the use of the lens for press work and lenses of this series will be sold only on the condition that they are not used for press work.

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THE PHOTOGRAPHIC SOCIETY

The opportunity to see the pictorial work of the Photographic Society of Philadelphia was afforded the public, at the Exhibition Room of the School of Industrial Art, Broad and Pine Streets, Philadelphia, during March.

This society is the oldest photographic club of America and numbers among its membership scientific workers of international reputation, as well as distinguished professional portraitists, besides an active number of pictorialists whose pictures have been given the highest awards for the work both in this country and in Europe.

This exhibition, furthermore, was of decided educational value to those interested in the new varieties of pictorial expression, for the work presented is by the leading exponents of the particular classes represented. Pictures in all the various mediums were shown.

Admission was free, and those who attended were invited to visit the room of the club, No. 1616 Sansom Street, where there are experts, glad to give information, relative to any particular topic, or instruction to those who are beginners.

It is the intention of the Photographic Society to establish at an early date a permanent home, equipped with all the up-to-date, modern appliances and facilities for the various branches of the art. There is room for a few more members on the roll, and the opportunity should be taken advantage of.

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An exhibition of a one-man show (W. A. Alcock) will be held at the rooms of the Photographic Society of Philadelphia, 1616 Sansom Street, from April 14th to May 12th. It will well repay pictorialists to visit this particular display, as it contains examples of today's best work by photography.

TECHNICAL & SCIENTIFIC

NOTES

TONING WITH SULPHUR

While this report of a communication by M. Abribat, before the *Chambre Syndicale Française de Photographie*, contains nothing new, it is an excellent survey of sulphur toning processes. We reprint, in the belief that it will be of interest to the professional and the amateur alike for its excellent summary of the subject.—C. B. N.

M. Abribat, after referring to the interest of the profession in toning processes with sulphur, proceeded to divide the same into two general classes:

1. Toning by direct sulphurization. (Single bath toning processes.)

2. Toning by indirect sulphurization. (Two bath processes.)

In the first class are the processes utilizing the polysulphides, such as pentasulphide, which, in a 1% solution, tones very slowly (about $\frac{1}{2}$ hour at 20° Centigrade, or 68° Fahr.), but is rendered more active by the addition of ammonium sulphocyanide. On prolonged immersion, warm tones tending to yellow, are obtained.

When an acid is added to a solution of hypo, an opalescent effect appears, due to the decomposition of the hypo and the liberation of sulphur in the colloidal state. On prolonged standing, this sulphur settles to the bottom, forming a yellowish deposit of sulphur.

Hypo, in effect, may be obtained by the combination of sulphur and sulphite of soda. The action of acid produces the reverse action, sulphur being liberated.

In the hypo-alum process, the colloidal sulphur, which is liberated upon the decomposition of the hypo, is utilized for toning. It readily combines with the silver of the photographic image to form silver sulphide.

For toning, we employ a very weak acid. In fact, in practice we do not employ an acid proper, but a substance, which in solution possesses an acid reaction due to hydrolysis (decomposition by water). The substance used is ordinary alum (double-sulphate of aluminum and sodium).

The temperature which is most favorable to the formation of silver sulphide, and consequently for sulphide toning, is around 50° Centigrade (122° Fahr.). At this temperature the gelatine is very fragile and for this reason an acid fixing bath is necessary, in order to avoid troubles due to the softening of the gelatine at the high temperature.

M. Abribat recommends the following formula for the hypo-alum toning bath:

| | |
|---------------------|------------|
| Boiling water | 1,000 ccs. |
| Hypo | 125 grams |
| Powdered alum | 30 grams |

When dissolved and cool, one gram of potassium iodide and one gram of silver nitrate are dissolved separately in a little water and added to the hypo-alum solution.

The indirect process of sulphide toning consists in bleaching the silver image with ferricyanide, and sulphurizing with monosulphide. For the bleaching solution, M. Abribat recommends the following formula:

| | |
|----------------------------|------------|
| Water to | 1,000 ccs. |
| Potassium ferricyanide.... | 20 grams |

The chemical reaction in the bleaching of the silver image may be explained as follows: The ferricyanide is oxidized and transforms the silver, composing the image, into a silver ferrocyanide. (This reaction is utilized in reduction by Farmer's method, the hypo dissolving the silver ferrocyanide.) When a soluble bromide, as potassium bromide, is added to the bleaching solution, the product formed is silver bromide. This is, in a sense, a new latent image and is sensitive to light. Therefore, the bleached image should not be exposed to very intense light or the purity of the whites will be destroyed. It is worth while to insist on this precaution on account of the fact that impure whites destroy the finer qualities of the print.

After bleaching, the prints are well washed to remove the yellow stain. The removal of this stain is hastened by the

addition of a small amount of acetic or citric acid to the water used for washing.

After washing, the prints are sulphided; a bath of sodium monosulphide being generally used. The sodium sulphide is decomposed by water and gives hydrogen sulphide (which is the familiar odor observed when using the solution) and soda. The solution is alkaline, and to a certain extent, dangerous to the gelatine, and to avoid trouble, an acid fixing bath should be used for the fixing of the print.

Although foreign to the subject, it may be remarked that a hydrogen sulphide gas liberated by the solution of sodium sulphide, attacks the silver salt of emulsions, producing a general fog, which cannot be removed. Sensitive emulsions should therefore be stored where there is no danger of attack from the hydrogen sulphide, liberated by the toning solutions.

Immersion for one minute in a 1 per cent solution of sodium carbonate, immediately before sulphiding, produces cooler tones, tending to purple. The same result may be secured by using a bleaching bath composed of potassium permanganate and hydrochloric acid, but this is not to be recommended.

(It is difficult to see why the author considers the permanganate bleach to be objectionable, unless he has employed an excess of permanganate. In this case there is a danger of stained whites, due to the brown stain produced by oxidation. Properly used, the permanganate bleaching solution seems perfectly satisfactory.)

Weak or yellowish tones lacking vigor are due to the use of a weak or aged solution of sulphide.

Cooler tones may be secured by the replacement of part of the monosulphide of the sulphiding bath by pentasulphide.

The duration of the final washing, the tanning due to the use of alum in the fixing bath, and the duration of drying are not of marked influence on the tone.

A year ago M. Munzinger indicated a practical method of obtaining red tones by sulphurization, using a sulphide bath consisting of sodium monosulphide and sodium sulphoantimonate, or Schlippe's salt. When fresh, this salt consists of yellowish white crystals, which become brown upon exposure and consequent oxidation. Solutions of this salt deposit a red precipitate which consists of antimony. The 10 per cent stock solution should be diluted immediately before use and kept in a container away from light. The mixture of 0.5 per cent

monosulphide to varying proportions of Schlippe's salt enable tones from warm brown to red to be obtained. The brownish red is secured with a solution containing one part of sodium monosulphide to fifteen parts of Schlippe's salt.

Papers vary in their responsiveness to this method. In general, rapid papers tend to give colder tones than slower varieties.

In conclusion, M. Abribat referred to the danger of using an old decomposed solution of sulphide, which has been transformed by oxidation into a solution of sodium hyposulphite, which attacks and partially dissolves the image, thus destroying the richness and vigor of the print.

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THE COMPOSITION OF THE PHOTOGRAPHIC IMAGE

A. AND L. LUMIERE AND SEYEWETZ

The silver images obtained by developing and fixing of the latent image on gelatine-bromide plates are generally considered to consist of pure silver, but the incomplete solubility of the image in various reducers is in opposition to this hypothesis.¹

In the opinion of Homolka, the silver image is a substance of variable composition depending upon the developer. This explains the variation of the color of the silver image with different developers, not by a modification in the state of division of the reduced silver, but as a combination of silver and a product resulting from the oxidation of the developing agent.

In the present investigation we intend to bring forward the analysis of a new contribution to the determination of the composition of the silver image.

For this purpose we have impressed a dozen Lumière gelatine-bromo-iodide plates 13 x 18 cm., containing an amount of iodide equal to 1.5 per cent of the bromide or 2.6 per cent of the total metallic silver in the bromide. These plates were exposed under a negative, receiving normal exposure, and were then developed with diamidophenol (Amido1), the duration of development being prolonged to about fifteen minutes, in order to obtain a very intense image. These plates were next fixed in acid hypo with a concentration of 25 per cent and thoroughly washed to eliminate every trace of hypo. Finally, the gelatine film was removed from the glass by treatment with a boiling solution of 10 per cent hydro-

¹In the case of Farmer's ferricyanide-hypo reducer, the silver image is completely dissolved, owing to the presence of sodium hyposulphite in the reducing solution.

chloric acid, which dissolves and destroys the gelatine.

The solid residue is then separated by decanting and washing in several changes of boiling water in order to remove all traces of soluble products, after which the final residue is gathered together, filtered, dried and examined.

After this it is next treated with a solution of boiling nitric acid, diluted with an equal volume of water, which rapidly dissolves the silver. After the action of the nitric acid is finished, the reddish residue is washed, dried and weighed. This residue, the composition of which we have determined, consists of silver iodide and a small quantity of sulphur, but no trace of bromide. The silver iodide of the residue is not AgI , but a silver sub-iodide, which, upon analysis, appears to correspond closely to the formula Ag_5I_2 .

Variation of the Composition of the Image with the Duration of the Exposure.

We have investigated to determine if the proportion of silver iodide contained in the silver image is constant for any given duration of exposure. To investigate this matter, we have exposed to diffused light for increasing times of exposure a series of plates 13×18 cm., all of these plates being developed under identical conditions with diamidophenol, the time of development being considerably prolonged (15 minutes at 17° Centigrade).

After complete washing, the gelatine film is removed in the manner already indicated.

The reddish residue is insoluble in nitric acid; it has the same aspect in all cases and is a constant of the duration of exposure.

This residue is next gathered, washed, calcined and dried. The calcination destroys the trace of organic material which the precipitate always retains, in spite of the treatment with nitric acid.

The following table shows the amounts of residue with the plates exposed for various times:

| Number | Relative Exposure | Amount of silver recovered from 12 13×18 cm. plates | Proportion of insoluble residue contained in 100 grams of the product resulting from development of the image. |
|--------|-------------------|--|--|
| 1 | 1 | 0.150 | 6% |
| 2 | 4 | 0.604 | 4.8% |
| 3 | 40 | 1.286 | 4.9% |
| 4 | 500 | 1.564 | 4.5% |

The residue is sensibly constant in composition. It contains 66% silver², 32% of iodide and 3% sulphur.

²The silver in the residue is not in the form of silver iodide, but a sub-iodide whose composition corresponds to the formula Ag_5I_2 .

Reduction of Silver-bromo-iodide in thin films by an Ammoniacal Reducer.

In order to determine if this is to be attributed to the thickness of the emulsion and its impermeability, so that the reduction of the silver haloid salt is incomplete, we began a series of experiments similar to the above, but employing plates having a very thin film containing 1 per cent of silver iodide. These plates were developed in the ammoniacal metoquinone developer,³ as advised for autochromes, for a period of 15 minutes.

After washing, the gelatine film is removed from the glass by the method already indicated.

These results also show that the substance composing the image includes a notable proportion of silver iodide, but no trace of bromide.

Data of the experiments follow:

| Number of Investigation | Relative Exposure | Amount of silver recovered from plates 13×18 cm. | Proportion of insoluble residue contained in 100 grams of the developed image. |
|-------------------------|-------------------|---|--|
| 1 | 1 | 0.450 | 2.66% |
| 2 | 4 | 0.476 | 3.57% |
| 3 | 40 | 0.529 | 4.3% |
| 4 | 240 | 0.506 | 2.75% |

This residue contains silver, iodide and sulphur and is sensibly the same as that from emulsions with thick films.

From which it will be observed that the amount of insoluble residue is a little inferior with thin films to that which we have obtained from thick films, yet the proportion of silver sub-iodide included in the silver image is still notable. It grows, within a certain limit, with the exposure, but after the limit is reached the action is to some extent retroactive.

Plates of Pure Gelatino-bromide.

We have investigated to determine if plates free from silver iodide give, on development, an image of pure silver or include a small amount of silver bromide reduced by the developer. To this end we have exposed and treated as before several series of 13×18 cm. plates consisting of pure gelatino-bromide emulsion.

Treatment with nitric acid gave a residue varying from 3 to 3.5 per cent of metallic silver. This residue includes neither bromide nor iodide, but a small amount of sulphur. The presence of sulphur may be attributed in this case to the use of a solution of sodium hyposulphite for fixing.

³The ammonia in the developer favors the penetration of the film.

The presence of silver iodide appears to hinder the deposit of sulphur within the image, as the proportion of sulphur included in the developed product of gelatino-bromo-iodide plates is only about 0.7 per cent of silver sulphide, while with plates free from iodide the amount is 3.5 per cent.

Fixing in Potassium Cyanide.

In order to determine if the presence of sulphur (in the developed image) can be attributed to the employment of sodium hyposulphite as a fixer, we replaced this salt with a 20 per cent solution of potassium cyanide. In this we have fixed two series of plates, one including silver iodide, the other without iodide. These plates received normal exposure and were treated according to the methods previously described.

In both cases the brownish residue, which is gathered after filtration, grows less and less dark upon drying and gives about 3 per cent of the amount of silver residue. It appears to be a sub-cyanide of silver. We failed to find either bromide or sulphur in these residues, but only a trace of iodide from the bromo-iodide plates.

In conclusion, our experiences show that the product of reduction of bromo-iodide and silver bromide by an energetic reducer is dependent on the time and that it is greater with the longer times of development. The developed image fixed in hyposulphite of soda does not consist of pure silver, but includes a notable proportion of a sub-iodide and a small quantity of sulphur from the fixing solution. The residue from both silver bromide and from silver-bromo-iodide plates contains sulphur, the amount of the same being greater in the former than in the latter case.

If hyposulphite is replaced by potassium cyanide, the reduction product of gelatino-bromo-iodide plates contains traces of iodide and a small quantity of a brown product which appears to be a silver sub-cyanide.

These results prove in a certain measure why the silver image treated by various reducers, which dissolve silver without the use of sodium hyposulphite, as the salts of peroxide of cerium, potassium bichromate, potassium permanganate or potassium or ammonium persulphate in acid solution, leave an insoluble residue which depends upon the time which the solution is allowed to act.—*Les Nouvelles Photographiques.*

USE OF COLORED LIGHT IN MAKING P. O. P.

The use of colored glass in printing-out work is by no means new, having been made use of in the days when albumen paper was almost of exclusive application. Very effective results even then accrued, and the method is well worth again considering, and so we take opportunity of abstracting from a communication to the "Camera," a Swiss photographic journal, a paper by Dr. Felix Formstecher, which treats of the use of color filters with modern printing out media as regards speed of operation and degrees of contrast effected.

Printing-out papers, it is remarked, contain as light sensitive agents both the chloride and the citrate of silver, which act differently towards light—that is, are differently affected by the spectrum. In the respect to papers containing exclusively the chloride of silver, a yellow screen, by the absorption of the violet rays which are most pronounced in their action on this salt of silver, there is a necessary retardation of the printing process (which is something quite different from that had by mere diminution of illumination), which gives greater softness to a print made by its action.

Under yellow light, on the contrary, hardness results with silver citrate. When first acted upon it has a maximum of sensitivity in the blue green (line F) and consequently is more quickly acted upon and more vigorously under the yellow light of the filter than the chloride, and the image is softer.

This accounts for the experience had when the printing is done in Winter, when the sunlight is more yellow and less brilliant, even at noon, than it is during the Summer months. So a paper with a content of silver citrate prints decidedly quicker and softer than a collodio-chloride paper, when exposed during Summer illumination. The filters used by Dr. Formstecher were made by coating glass plates with the following mixture: Collodion (6%), 50 c. c.; Solution Agfa, special yellow, 100 c. c. The dye solution is prepared by dissolving one gramme of the dye in 200 c. c. of alcohol and then filtering it. This filter absorbs all the blue and violet rays and transmits, besides the yellow, the red and green.

A collodio-chloride paper, rich in silver chloride and poor in silver citrate, was used as standard. At the beginning of light

action, it was found that the half tones built up slowly. When a double filter was used, the faintest half tones showed a richer contrast than that of prints made without any filter. From these facts the deduction is made that a paper with much chloride and little citrate of silver, not only gives harder prints under yellow light, but it also permits a dense deposit and greater range of tones, in contrast to the specific so-called "contrast" paper of the market.

In the experiments on the influence of blue filters it was found that the results were soft because of retardation of action upon the silver citrate. The contrast of the high-lights and the density of deposit of the deepest parts remained unchanged. Hence blue screens give with chloride of silver soft prints with great range of tones. The use of blue filters is therefore only called for when the negative under white light gives very hard prints. In the case of negatives under-exposed, however, white light will give better results than blue.

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TONING TRANSPARENCIES

(Resumé of a lecture by A. Seyewetz, before the third Congress of the Chemical Industry, held at Paris on October 21 to 26, 1923.)

The author has made a systematic investigation of the various methods of toning by the mordanting of dyes, and methods of using dyes of diverse character. He has experimented with mordanting solutions consisting of silver iodide (opaque images), silver ferrocyanide associated with ferrocyanide of copper, uranium (*Science Tech. Ind. Phot.* 3 p. 35), iron, cobalt, silver ferrocyanide associated with compounds of chromium (*Sci. Tech. Ind. Phot.* 1 p. 5, 18, 42, also 3 p. 8), with products of the action of quinone in the presence of alkaline bromide (*Lumière and Seyewetz, 1910, also Sci. Tech. Ind. Phot.* 3 p. 52), with silver sulphide (*Sci. Tech. Ind. Phot.* 3 p. 122), and silver sulphocyanide and copper. This last method is due to Christensen (*D. R. P., 319,469*), and is the one which has given the best results from all points of view; such as intensity of color, purity of whites, resistance to washing, and the ability to fix a large number of dyes. The formula advised is:

| | |
|------------------------------|-----------|
| Water | 1000 ccs. |
| Potassium citrate | 60 grams |
| Cupric sulphate (cryst.).... | 40 grams |
| Potassium sulphocyanide .. | 20 grams |

The image bleaches slowly. After washing, the image will take up any one of a large number of basic dyes and also acid dyes derived from pthalene, using solutions having a dye concentration of 0.5% with 1% of acetic acid.

The dyes which give good results, either singly or a combination of two or three are crysoidine, Bismark brown, new phospene, auramine, pyromine G, acridine red 3B, malachite green (weak with copper ferrocyanide), erythrosine, methylene blue, methylene green, Capri blue, Nile blue 2B, toluylene red, phenosafranine, metaphylene blue 2B, Bale blue (weak with sulphocyanide), quinoline yellow, acridine orange and thioflavine T.—*Revue Française de Photographie*.

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WARM TONES BY DIRECT DEVELOPMENT

C. B. NEBLETTE

In *THE CAMERA* for January of this year, reference was made to the range of tones obtainable by physical development in the case of lantern slides and transparencies. Physical development is not practical with paper, but there are other methods of obtaining various tones on paper by direct development which do not seem to have attracted the attention which they deserve. It cannot be denied that a satisfactory method of toning by development offers many advantages over after-toning processes, chief among which is the elimination of all uncertainty as to the final result, for the same may be judged from the appearance of the print as it is passed into the fixing solution, so that if the color is not desirable, the treatment of the second print may be altered as judgment dictates.

Over-exposure, followed by development in a heavily restrained solution, as successfully applied to the development of lantern slides for warm tones, cannot be said to be entirely satisfactory for use with paper. Certain brands of paper give agreeable tones by this treatment, especially the I-X-I paper of Bauchet, a French product obtainable in England, but not in this country, and the "Yto" warm tone paper of Kentmere, Ltd., Snavely, Westmoreland. The investigations of Nietz and Huse (*Brit. J. Phot.*, 1917, 497) show that the majority of chloro-bromide papers of the "gas-light" type are unsuited to development in this manner.

Pyro, pyrocatechin and sulphinol are developing agents which have been recom-

mended from time to time in various quarters for securing warm tones on bromide paper by direct development and under certain conditions are quite satisfactory.

The recently published method of Ermen, using p-phenyl-diamine and phenol or naphthol compounds, seems to offer wide possibilities and may prove to be the most successful method, but the writer has as yet been unable to give it a fair test.

Warm Tones by a Restrained Developer.

As previously remarked, only a few papers give satisfactory results with this method. The *Dictionary of Photography* gives this following formula:

Cool Sepias. Exposure 5-6 x Normal.

Developer:

Metol-hydrochinone as
for black..... 1 oz.
Ammonium carbonate
solution (see below..) 50-60 minims
Water to make..... 6 ozs.

Warm-brown to red. Exposure 6-8 x Normal.

Metol-hydrochinone as for
black 1 oz.
Ammonium carbonate solution
(below) ¼ oz.
Water to make..... 6 ozs.

The ammonium carbonate solution is:

Ammonium carbonate 1 oz.
Ammonium bromide 1 oz.
Water to make..... 20 ozs.

The final tone is definitely determined by the duration of development. The exposure determines whether the correct stage of development as regards detail and depth is reached with the time of development required for the production of a definite color. Thus for a certain color the time of development must be definitely fixed and the time of exposure adjusted to secure the proper depth and detail of the print.

When dry, the print is about the same color as when taken out of the developer; the weakening which occurs in the fixing bath may be disregarded, as the color and detail return on drying.

This method of producing warm tones was investigated by Nietz and Huse (loc. cit.) for its adaptability to chlorobromide papers. They found that the exposure must be considerably increased from 75 to 100 times normal. The most suitable developing agent they found to be chlorhydrochinone. The exposure must be absolutely accurate and there is a considerable increase in contrast, so that it is not thought that this method is useful with gaslight papers.

Pyro and Pyro-acetone Developers for Warm Tones.

In the *British Journal of Photography* for 1918, page 54, David Ireland advised the use of sodium acetate with the pyro developer for the production of warm tones, and the addition of acid sulphite to prevent rapid oxidation of the solution in use. His formula follows:

Sodium carbonate (dry).. 110 grains
Sodium sulphite (dry).... 60 grains
Sodium acetate 70 grains
Potassium bromide 5 grains
Acid sulphite solution..... 5 drams
Water to make..... 4 ounces

To prepare the developing solution, add to 2 drams of this solution 5 grains of dry pyro and make up to 2 ounces with water. Development is rather slow, the image appearing in about a minute, and the developer should not be unnecessarily agitated, as this only hastens oxidation. It is best to take fresh solution for each print, or at least for not more than two prints in succession. Fix in an acid fixing bath.

The following pyro-acetone developer is recommended in the *Dictionary of Photography* for warm-brown tones:

A. Pyro 22 grains
Sodium sulphite (dry).... 60 grains
Sulphuric acid..... 3 minims
Water to make..... 1 ounce
B. Acetone 1 part
Water to make..... 20 parts

For use take equal parts of A and B. For warmer tones increase the acetone.

Pyrocatechin for Warm Tones on Direct Development.

The following pyrocatechin developer was recommended by F. Pospiech in *Das Atelier* (1913, 12, 140) for producing warm tones on several brands of bromide papers:

Potassium carbonate (10%
solution 5 parts
Pyrocatechin (10% solution). 1 part
Distilled water to make..... 12 parts

The 10% stock solution of pyrocatechin keeps well, but the solution containing alkali ready for use will not keep more than a few hours.

Sulphinol as a Developer for Warm Tones.

Sulphinol, a developing agent introduced before the war by the Societe des Matieres Colorantes et Produits Chimiques de Saint Denis, Paris, was advised for use in this connection by Hergeth (*Bull. Soc. Franc. Phot.*, 1913, p. 40).

Alone sulphinol is a very slow acting developer, requiring about three minutes for the appearance of the image, but an equally desirable tone, together with far greater speed, may be obtained in combination with hydrochinone. Hergeth recommended the following formula:

| | |
|---------------------------|------------|
| Sodium sulphite (dry) ... | 25 grams |
| Sodium carbonate (dry).. | 50 grams |
| Sulphinol | 10 grams |
| Hydrochinone | 5 grams |
| Water to make..... | 1,000 ccs. |

No bromide need be added, as it merely serves to slow development. The image appears in about six seconds and development is complete within two minutes.

Production of Warm Tones by the addition of phenol or naphthol Derivatives to p-phenyl-diamine.

In 1912 R. Fischer patented (D. R. P. 253,335; B. P. 2562 of 1913) the addition of a substance to developers in order to combine with the oxidation product of the same to form a sparingly soluble colored substance. The use of p-phenyl-diamine, its homologues or derivatives, and phenol, indophenol or naphthol compounds were given as examples of the application of the principle embodied in the patent.

The same principle was independently discovered by W. F. A. Ermen in 1923 and published by him in the *British Journal of Photography* (1923, 70, 47 and 299). The first paper describes a method of obtaining blue tones by direct development, the second brown tones.

The formula advised by Mr. Ermen for blue tones is as follows:

| | |
|--------------------------------------|------------|
| Dimethyl paraphenylene diamine | 6 grams |
| Sodium sulphite (dry)... | 8 grams |
| Sodium carbonate (dry).. | 10 grams |
| Water to make..... | 1,000 ccs. |

To 100 ccs. of this solution 33 ccs. of the following alpha naphthol solution are added:

| | |
|----------------------|------------|
| Alpha naphthol | 14.4 grams |
| Caustic soda | 8 grams |
| Water to make..... | 1,000 ccs. |

The lantern slide or print, which has received normal exposure, will give an indigo blue image when developed in this solution, due to the image consisting of a mixture of silver and indophenol.

For the production of brown tones, the alpha naphthol is used in conjunction with ortho-amidophenol-sulphate. The following formula is recommended by Mr. Ermen:

A. Ortho-amidophenol-sulphate. 5 grams
Bisulphite of soda..... 35 ccs.
or Potassium metabisulphite 25 grams
Water to make.....200 ccs.

B. Caustic soda 10 grams || Water to make..... | 100 ccs. |

C. Alpha naphthol 5 grams || Solution B | 30 ccs. |
| Water to make..... | 500 ccs. |

For use with lantern slides take:

A 20 ccs.; B 8 ccs.; and dilute to 100 ccs.

A lantern slide which has received normal exposure yields a brown-toned image, the exact shade depending chiefly on the emulsion. To obtain more contrast, and a deeper shade of brown, we may add a portion of the solution of alpha naphthol as follows:

A, 20 ccs.; B, 8 ccs.; C, 45 ccs., diluting to a total volume of 100 ccs. for use.

Results on bromide papers vary considerably with the brand of paper. In the majority of cases, the last-named combination is best, as with the A and B solution alone the tone is only slightly brown. Addition of the alpha naphthol produces a warmer brown. For still warmer tones, one to five grams of hydrochinone may be added to the A solution.

A wide range of really remarkable tones, ranging from blue-gray to chocolate-brown and purple, may be obtained on lantern slides by the addition of thiocarbamide to the developing solution. Mr. J. Dudley Johnson, the President of the Royal Photographic Society, has extensively developed this process. His exhibit at the Annual Exhibition of the Royal last year contained thirty slides showing the various tones obtainable by this method and the effect of the various factors on the final tone. His paper is too long to be reproduced here. It may be found in the *Photographic Journal* for April, 1923, or the *British Journal of Photography*, 1923, p. 595. It is a very delicate process, demanding not only the most careful attention to the minutest detail, but also a considerable amount of skill, which can only be gained from personal experimentation.

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The illustrated Italian monthly, *Il Corriere Fotografico*, which was formerly published at Milan by G. A. Dell'Acqua, has been acquired by M. C. Boravalle, A. Bologna and S. Bricarelli and in the future will be issued from 6 Via Stampatori, Turin.

THE CARE OF THE HANDS

A considerable number of the solutions employed in photography are injurious to the skin, producing unsightly stains or, in some cases, painful skin eruptions. The methods of preventing and healing the ulcers, due to the use of photographic solutions, have been the subject of a paper by M. Frank in *Kamera-Kunst*, which we reprint with acknowledgment. In reference to the familiar poisoning action resulting from the use of metol, it may be pointed out that the identity of this poisonous substance has been determined and methods devised for the production of metol free from any tendency to affect the skin. (See *Photo. Journ.*, 1923, 63, 223-229; also *Brit. J. Phot.*, 1923, 70, 218.—Ed.)

Different workers are variously affected by different solutions. The nature of the skin is the most important factor in the matter; persons having plump, oily skins have greater immunity from attack by solutions than those whose skin is dry and consequently cracks easily. Those who are unfortunately placed by nature in the second class may use as remedies glycerine, vaseline, lanoline or such greasy substances.

For the most part the action of photographic solutions does not persist long after their use, and much may be done by frequently washing the hands with soap and water. If one makes it a rule to rinse the hands in water immediately after having been in contact with the solution the danger of poisoning is greatly reduced. This practice offers no difficulty; it becomes a habit to rinse the hands briefly after each operation in a dish of water placed within reach of the hand.

To prevent the skin from drying and cracking, it should not be unnecessarily exposed to cold, damp air. When it is impossible to preserve this precaution, glycerine may be used to advantage.

Stains due to the use of pyrogalllic acid may be largely prevented by frequent rinsing of the fingers in water between operations. Any stains which form may be removed by means of a 10 per cent solution of oxalic or citric acid, or in default of these, by lime added to a little glycerine.

Several methods of removing the stains resulting from the use of various developing agents have been recommended by M. Lumière. The first method consists in treating the fingers first with a 5 per cent solution of potassium permanganate, followed by a 5 per cent solution of sodium bisul-

phite, which removes the permanganate stain and leaves the hands clean and free from stain. The permanganate solution may be replaced by a solution of potassium bichromate to which a few drops of sulphuric acid have been added. (We differ with the author regarding the use of potassium bichromate in this connection. Potassium bichromate itself has a corrosive action on the skin and hence is liable to cause painful ulcers, a fact of which many carbon workers are sadly aware, and for this reason we cannot advise the use of bichromate. A solution of bichromate and sulphuric acid, however, makes an effective cleaner for trays, bottles and tanks.—Ed.)

The second method consists in the use of Javelle water followed by a solution of sodium sulphite and thorough washing in water.

Those persons whose hands are especially sensible to the action of developing agents do well to apply vaseline or lanoline to their fingers before development.

For irritation of the skin, due to the use of metol, the *Lumière Agenda* recommends the following:

| | |
|------------------|----------|
| Vaseline | 30 grams |
| Lanoline | 40 grams |
| Ichthyol | 10 grams |
| Boric acid | 40 grams |

Silver nitrate has a double action. Its reduction to metallic silver produces a brown stain, while it has in addition a strong corrosive effect on the tissues. For removal of the brown stain the combined toning and fixing bath for P. O. P. may be used, or any of the various reducers, with the exception of potassium ferricyanide, which has a strong toxic action on the skin and for this reason is not to be recommended.

The author also gives formulas for five other stain removers.

| | |
|------------------------|----------|
| 1. Water | 20 ccs. |
| Sodium sulphate | 20 grams |
| Calcium chloride | 10 grams |

This is shaken energetically before use and applied with a brush.

| | |
|------------------------------|-----------|
| 2. Water | 1000 ccs. |
| Potassium permanganate | 2 grams |
| Pure sulphuric acid | 10 ccs. |

This is the same solution as employed for the reversal of Autochrome. The stain resulting from the permanganate is removed by immersion in hypo.

| | |
|------------------------|----------|
| 3. Water | 50 ccs. |
| Potassium iodide | 10 grams |
| Iodide | 1 gram |

When the stain has disappeared, place

the fingers in a fixing bath containing 20 per cent ammonia in order to remove the iodide stain. Follow with a thorough washing in soap and water.

4. Water 50 ccs.
Copper chloride 30 grams
5. Treat with Javelle water followed by hypo.

The stains of gold may be removed by means of a solution of calcium chloride, the two combining to form gold chloride, which is removed upon washing.

For the removal of stains due to the use of platinum salts immerse the fingers in

- Distilled water 30 ccs.
- Ammonium sulphocyanide. 1 gram
- Acetic acid ½ cc.

Follow with abundant washing in water.

Stains due to the action of acetic acid may be removed by means of ammonia. Where the hands come in contact with acid frequently it is well to protect the skin with lanoline.

Uranium toners and intensifiers produce stains which may be removed by means of cotton wool soaked in ammonia or a 10 per cent solution of potassium carbonate.

Photographic solutions containing potassium bichromate have a powerful corrosive effect on the skin and on continued use of the substance cause painful ulcers, which are slow in healing. The sensitivity of different persons to these solution varies greatly and it is well to take all possible precautions to prevent the solution penetrating the skin. For this purpose glycerine or vaseline is useful. Dr. Riederer recommends that, after using a solution of potassium bichromate, the hands should be immersed in a 5 per cent solution of potassium permanganate acidified by means of a few drops of sulphuric acid. The application of a solution of ammonia may also be recommended.

Prevention, however, is better than cure and the use of rubber finger tips, or a coating of wax formed by the addition of 28 grams of wax to 225 grams of ether, is to be recommended when handling all solutions of a poisonous character.

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Among those recently admitted to membership in the Societe Française de Photographie was Mme. LaForge, née Marie-Louise Niépce, a lineal descendant of M. Nicéphore Niépce, who is now generally credited with the discovery of photography in 1824.

PORTRAITURE WITH INFRA RED RAYS

The use of the infra red rays in photography has been turned to good service both in astronomy and in the secret service signaling.

M. L. Charbonnear, who specialized with the rays during the war and demonstrated the value of the application for detection of presence of icebergs, now comes forward with its use as a means of portraiture in the dark.

The model, in total darkness, is illuminated by the fluorographic method which Draper had used for the study of these rays, and Player for the reproduction of manuscripts. The source of illumination is a projector emitting exclusively infra red rays (of wave length of 3.4 microns), isolated by a special filter.

A phosphorescent screen, previously excited to maximum intensity, is placed in the camera at the position of the ground-glass. The infra red image destroys the luminosity of the plate in proportion to its intensity, forming on the screen on which it is projected, making there a negative image; means are used to control effect by withdrawal of the holder for a moment. Impression is effected upon the sensitive plate in a positive state.

In consequence of the non-achromatism of the lens for rays of large amplitude, and at the same time, in consequence of the necessary diffusion which occurs in making the copy, a beautiful soft effect of the image is produced.

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AMMONIUM POLYSULPHIDE FOR SEPIA TONES

M. G. Underberg, after a comparative test of the various sulphide toning baths, as reported in the *British Journal of Photography*, January 25th, expresses his preference for the ammonium polysulphide.

It is not a commercial commodity, but is easy of preparation. All that is necessary is to sprinkle ordinary flowers of sulphur into the commercial solution of ammonium sulphide (silver of sulphur) until no more shall be taken up. It can thus be made at any time when needed.

A few drops of this polysulphide added to eight or ten ounces of water makes a toning bath which works uniformly and yields a beautiful sepia tone. The temperature of the bath should be about 90° Fahr.

REASONS WHY YOU SHOULD MAKE WRITTEN CONTRACTS WITH YOUR EMPLOYEES

A very great degree of misapprehension exists among employees, and among employers as well, as to the law of employment contracts. Employees, for instance, if they are employed at \$5,000 per year, believe that that puts their employment on a yearly basis and that they practically have a year's contract, with a requirement read into it that a year's notice must be given to terminate the relation. There is not the slightest foundation for this belief, as I shall point out.

Another popular delusion among employees is that if an employee really has a year's contract and is discharged, say, at the end of three months, he has a good claim for nine months' salary and can loaf for that length of time. This idea is just as baseless as the other.

The first question naturally arises where there is no written contract. I have always believed in and advised making a written contract with every worthwhile employee. To be sure, you can't compel him to work for you, even under a contract, if he doesn't want to, unless he is some rare and special sort of employee.

Many employees will regard a written contract much more carefully than the indefinite arrangement which covers the relation between most employers and employees.

Most employers refuse to make written contracts with their employees because they think they will in some way prevent their discharge if occasion arises. This is not in any large measure true. Every employment contract should contain a provision binding the employee to furnish services "satisfactory to the employer." Even outside of this, the employee is supposed to be competent to fill the position he is taking; if he proves not to be, he can be discharged regardless of the contract. And he can be discharged for misconduct and other infractions. In other words, the employer parts with very little of his right of discharge when he signs a (properly drawn) employment contract.

If there is a written contract, it should cover all phases of the relations and leave nothing to conjecture. But suppose there isn't any written contract, what is the legal status of the parties? In the first place, in this country, the simple fact that a man is hired at a weekly or a monthly or a yearly

salary doesn't mean that he has a week's, or a month's, or a year's contract. It merely fixes the rate at which he is to work. The weight of authority in this country is that where nothing is said between the parties when the hiring is done, it is a hiring at will, no matter what the salary basis, and either party can terminate it at any time. California is about the only State which enforces a contrary rule; there a contract at \$5,000 a year would be a year's contract.

The rule also has some other exceptions. There may be evidence in the case which would show that the parties contemplated that the relation should last at least a year or at least a month, as the case may be. The law isn't quite settled on this point. For instance, in an Illinois case and some cases in other States it was held that when a man was hired at so much a month there was an implication that he was to keep his job for at least one month. This would not, however, apply to hiring at so much a year. Under the weight of authority in this country (in England and Canada the rule is different) the employing of a man at so much per year does not give him a yearly contract unless there are circumstances in the case which clearly show an intention by both parties that a year's contract was intended.

Where there is nothing to show a contract for any definite term, and the hiring is therefore one at will, neither party is obliged to give the other any notice at all, though common courtesy would always constrain that notice be given. A written contract would, of course, always provide for so much notice.

Now about the duty of the employee after wrongful discharge. The principle which is perhaps most firmly settled in the law of employment contracts is that it is the employee's duty to seek for other employment at once. He can't intentionally loaf one hour. If he secures other employment he must credit the salary it pays him on account of his claim against his former employer. If he could have secured other employment, but did not, he must credit what he could have made against his claim. The law requires him to minimize the damage as much as he can reasonably do it.

I don't mean that if a man is employed as purchasing agent at \$10,000 a year and is wrongfully discharged before his time, he is required to minimize his damages by taking a job as bell boy or bookkeeper or salesman. He is not bound to take employ-

ment of any other class than that of which he was unjustly deprived. Nor is he obliged to take even that if it involves making a contract for more than the unexpired portion of his first contract. Nor to take employment in a different place. If, however, the day after he was discharged an employee was offered another job at the same salary in the same town and for the same period, his damages are gone, for he has been put in a position where he won't or needn't sustain any.

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TESTING FIXING BATHS

When in doubt make up a fresh fixing bath. That motto ought to be nailed up in every dark-room in the country.

Film-fixing is comparatively easy to estimate, because the disappearance of the undeveloped silver bromide from the back of the negative is a very clear indication of the speed at which the bath is working. It is good policy to discard the bath as soon as the time of fixing is double that of a fresh solution.

A sound rule when fixing papers is to allow one-half pound of hypo to each one-gross of cabinet prints, or their equivalent. If you are fixing many more prints than this, you are risking their permanence; if you work your fixing bath much less, you are wasting a part of its useful life.

The easiest way of keeping count of the work done by a fixing bath is to hang a slate on the wall close by and chalk up the number of prints put through in each batch.

It is very little trouble to test a fixing bath and determine its strength with a fair degree of accuracy.

Cut a number of one-inch test strips of the unexposed paper for which the bath is to be used. Immerse these in the bath for varying lengths of time; fix one strip for 30 seconds, another 60 seconds, 90 seconds, 120 seconds, and so on. Fix about half a dozen strips and pencil the time of fixing on the backs.

Wash them thoroughly and transfer them to a 1% solution of sodium sulphide, leaving one end projecting from the bath to serve as a comparison. The presence of even a tiny quantity of silver will be shown by a brown or yellow-brown stain.

In this way you have an accurate test of the rate of fixation, for if the strip does not discolor in the sulphide bath, it is completely fixed. The best way to arrive at a

margin of safety for a bath is to make the above test when it is fresh—and to discard it when the time of complete fixation is doubled.

This test does not indicate the time required for fixing a large print. It is not possible to insure complete fixation over a large surface in the time taken by a small test strip, while a number of prints in the same dish will require longer still; all that the test does is to tell you the activity of the bath. There is another interesting question relative to fixing baths—that of the strength of the bath and its effect on speed and its efficiency.

The idea that the more hypo you use the faster it will fix is a false one. The rate of fixation increases with the addition of hypo up to a concentration of about 40%, beyond which it decreases until, with a concentration of 80% or 90%, a negative will refuse to fix at all. If there is a special reason for fixing a few negatives quickly, then 40% will give the maximum speed. But in ordinary work it is better to avoid such a strong bath.

And remember that a fixing bath should be kept at an even temperature just as a developer should.—*Photo-Digest*.

✽

ON PRINTS

The printing papers of the present day are truly wonderful products, yielding prints of great artistic excellence, with the minimum amount of attention and care. We are often inclined to think that it is so easy to produce a respectable print on any of the better grades of modern papers that the worker is too easily satisfied, accepting a mediocre result and failing to realize the capabilities of the process.

For example, we think that far too little attention is paid to the influence of the surface of the paper on the final result. We think it would be a worth-while experiment, for those workers who are at present settled on two or three surfaces of paper to secure similar surfaces in other makes of paper and make a print from each, using the same negative. An examination of this series of prints will show to what extent various makes of paper listed as being identical in surface vary in general character. Taking into consideration the various surfaces listed under the same general description, there are a large number of surfaces available for the use of the critical photographer and it seems to us a pity that more use is not made of them.

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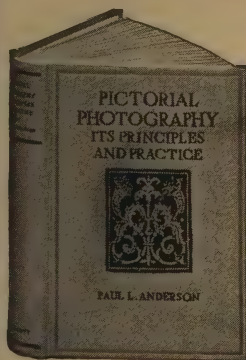
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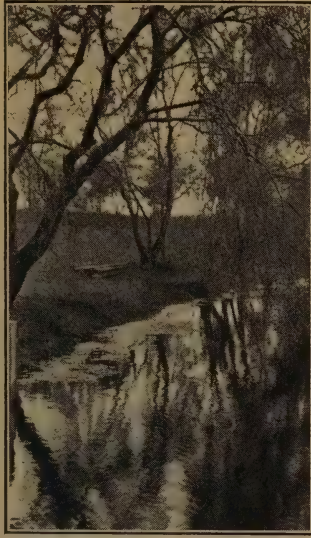
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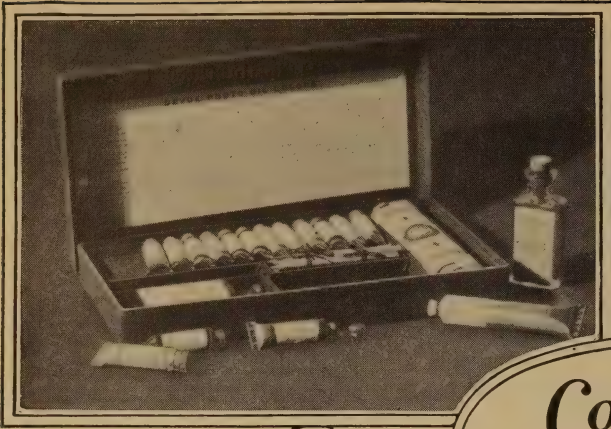
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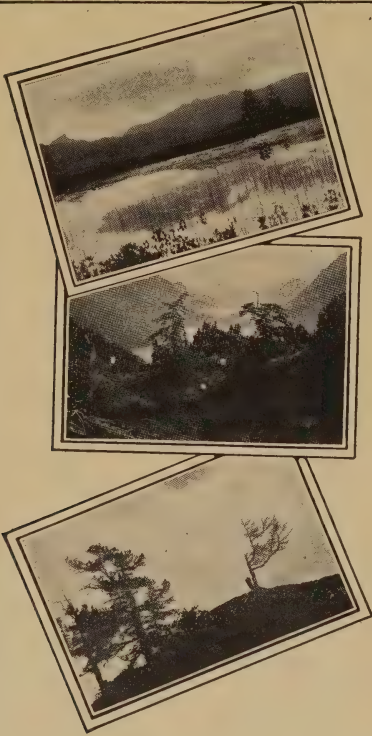
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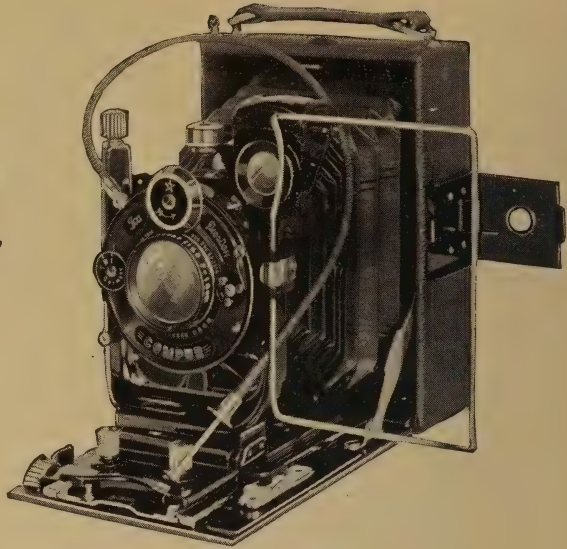
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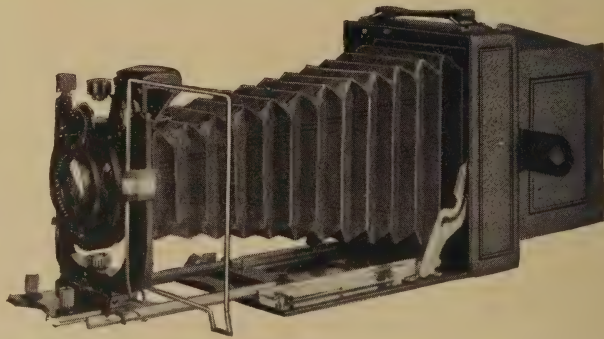
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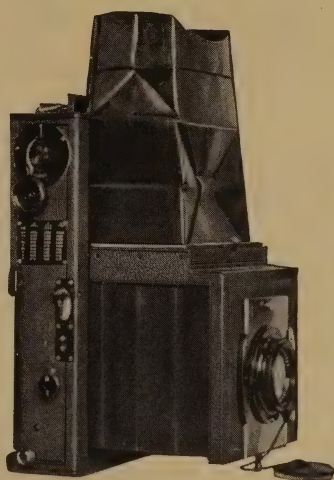
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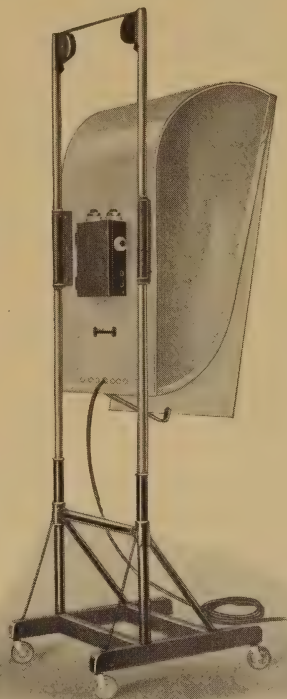
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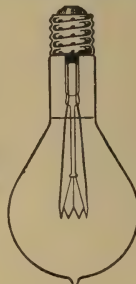
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Abel's Weekly, November 17, 1923

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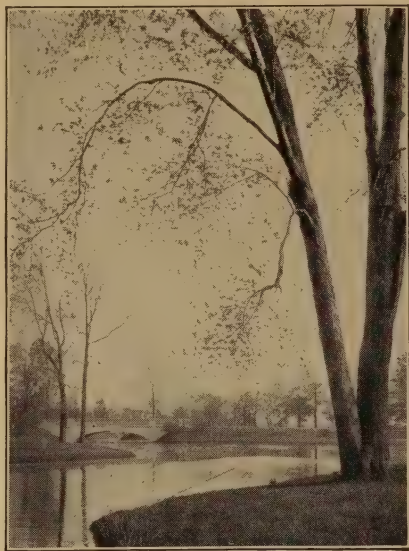


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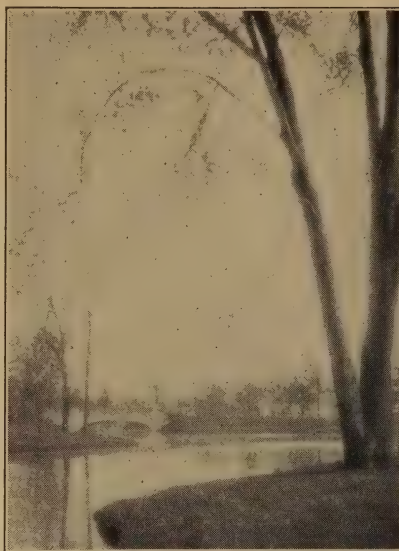
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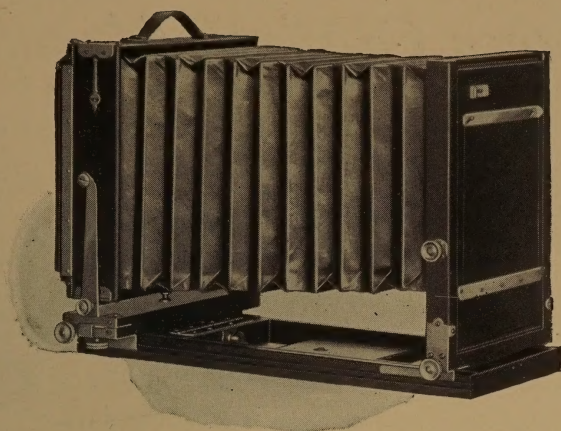
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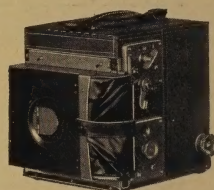
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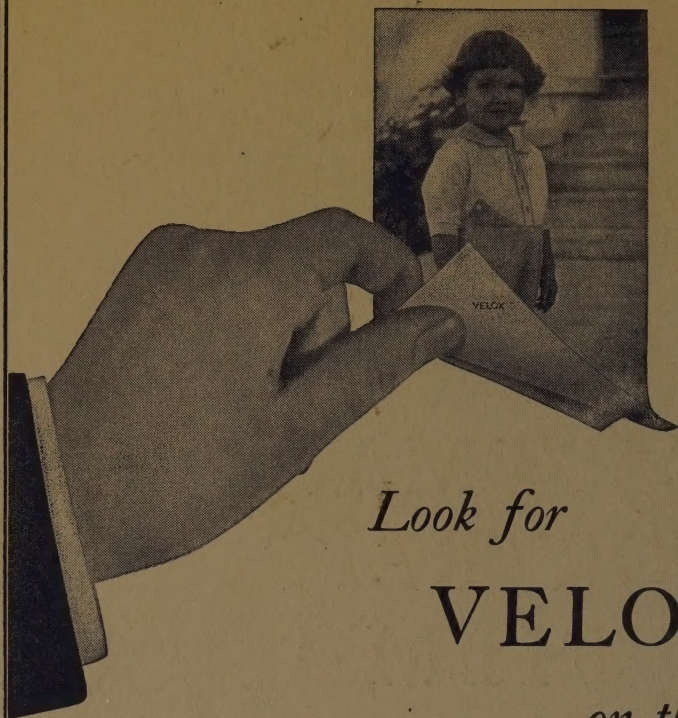
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